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REPORT OF A SERIES OF CASES OF CANCER OF THE CERVIX UTERI TREATED BETWEEN 1922 AND 1929 WITH SURGERY, RADIUM AND X RAYS.[1]

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IN 1924 a committee appointed by the American College of Surgeons undertook the investigation of a series of cases of cancer of the cervix. The committee studied case reports of patients treated from 1914 to 1919 inclusive. There were 1,210 case records for analysis. The report appears in *Surgery, Gynecology and Obstetrics*, Volume XXXIX, Number 1, July, 1924, at page 18; it was amplified in 1929, *vide* Volume XLIX, Number 2, August, 1929, page 247.

The subject matter of the present study is based on the article referred to. It covers a series of patients treated between 1922 and 1929 by various methods. The treatment used was in most cases that available at the time, namely, panhysterectomy, diathermy, radium, deep X ray therapy.

Panhysterectomy.

In each case submitted to operation the operation performed was a panhysterectomy of the type introduced by Thring, of Sydney, to whom the author had the privilege of being a house surgeon. It was a radical abdominal hysterectomy, the whole of the uterus, the tubes and ovaries and the upper part of the vagina being removed, together with the lymph glands of the hypogastric and external iliac groups. In some cases the vagina and abdomen

[1] Read at the Fifth Australian Cancer Conference, Canberra, April, 1934.

were completely closed at operation. In others drainage was established through the vagina. In all, 25 patients were treated by this method with a post-operative mortality of 6, or 25%. Of these, one died of cardiac failure four days after operation, one died of uræmia four days after operation, two died of pelvic peritonitis within a week of operation, one (who was found to be inoperable) died of shock twelve hours after attempted operation, one died of post-operative shock twenty-four hours after operation.

Seven are alive and well after periods as follows, namely, one 12 years: II 2; one 7 years: II 11; one 9 years: II 4; three 6 years: II 16, I 6 and I 10; one 5 years: II 21.[1]

Diathermy.

Diathermy was first used in 1922. It has been used mainly as a preliminary to and preparation for panhysterectomy. From a surgical point of view it has the following advantages, namely:

1. It cleans up the field and removes the risk of sepsis.
2. It arrests hæmorrhage.
3. It stops the foul discharge.
4. It enables the patient's condition to be built up preparatory to operation a month or six weeks later.
5. By removing the inflammatory mass it cleans up the gross inflammatory enlargement of the lymph glands.
6. It is thus an excellent preliminary to further treatment, whether operative or by radium or deep X ray.
7. Where further operation was impossible, it was, before radium was available, a most useful palliative measure.

In this series diathermy was used as palliation in ten cases, as a preliminary to hysterectomy in twelve cases (of these twelve patients four are alive and well for six to twelve years), as a preliminary to deep X ray therapy in two cases, and as a preliminary to radium and deep X ray therapy in one case. This patient was operated on and the abdomen closed as inoperable by a competent gynæcologist. She was afterwards treated by diathermy followed by radium and deep X ray therapy and is alive and well after six years.

Radium.

Radium has been available in Sydney for treatment only since 1925.

From 1925 to 1928 the only available supply was from a private firm which supplied it in five needles of ten milligrammes each. The needles are made of stainless steel 0·4 millimetre thick, giving a screenage of 0·4 millimetre of brass, equivalent to 0·2 millimetre of platinum. Each needle is 28·0 millimetres long by 2·8 millimetres in diameter and contains radium sulphate. Only the middle third of the needle contains radium. This set of needles was used in seven cases of the series, as set out in Table I.

TABLE I.

Patient.	Treated.	Died.	Survival Period.	Cause of Death.
IV 1	June, 1925	May, 1930	5 years	Secondaries. No local recurrence.
II 7	October, 1926	February, 1927	4 months	Uræmia. No recurrence.
II 10	April, 1927	December, 1928	20 months	Uræmia. No recurrence.
II 15	September, 1928	October, 1930	2 years	Secondaries. No local recurrence.
II 22	April, 1929	July, 1931	2 years and 2 months	Pneumonia and cachexia.
II 6	September, 1926	Alive and well	8 years	No recurrence.
IV 4	January, 1927	January, 1930	3 years	Senile. No recurrence.

The Commonwealth of Australia radium was supplied in June, 1928. It was put up in needles and tubes. The needles were screened to 0·5 millimetre of platinum. The five-milligramme tubes were screened to 0·5 millimetre of platinum and the ten-milligramme tubes to 1·0 millimetre of platinum. In 1928 no heavier screenage than 1·0 millimetre of platinum was used for any case. The tubes were made of gold-platinum alloy with inner cells of platinum. There were two-milligramme, three-milligramme and four-milligramme needles available also, which roughly measured overall one and a quarter times the actual length. The overall size was roughly 1·3 millimetres.

Deep X Ray Therapy.

Deep X ray therapy has been available in varying dosage and screenage. Several different machines have been used for deep X ray therapy, but in general they conform to the principles of the machine used in the deep therapy department of the Royal Prince Alfred Hospital. I am informed by Dr. Nesbit, the honorary radiologist in charge, that in 1928 the conditions were as follows:

Conditions.—(*a*) The type of apparatus used was a Kelly's volt apparatus. "Metalix" tubes were used from the time of installation to September, 1931. (*b*) Peak voltage or constant voltage (for condenser apparatus)—the peak voltage was about 185 kilovolts up to December, 1932. (*c*) Tube current in milliampères—the tube current varied from 15 milliampères to September, 1931. (*d*) Material and thickness of the filter or filters—one millimetre of copper till March, 1931. (*e*) Focal distance in centimetres—45 centimetres. (*f*) Number, position, shape and size of the irradiated fields—in pelvic cases four fields were used, two iliac and two gluteal, in size 20 by 25 centimetres. (*g*) Data on the relation of the deep to the skin dosage—30% to 35% of skin dose was considered to be delivered at depth.

Dosage.—(*a*) Duration of each irradiation treatment—about 20 to 25 minutes. (*b*) Skin dose for

[1] The numbers refer to the case records of the patients concerned. I, II, III, IV refer to the groups. 1, 2, 3, 4 *et cetera* refer to the series in each group.

each treatment in *R* units—300 *r*. (*c*) Number and position of irradiated fields in each series of treatments—four fields, two iliac, two gluteal. (*d*) Number of treatments to each field and the intervals between the treatments, four treatments to each field; intervals to each field, three days; but treatment is given to one field every day. (*e*) Total skin dose for each field, 1,200 *r*. (*f*) Number of series of treatments, two to three. (*g*) Total dose to each field for each series of treatments, 1,200 *r*. (*h*) Total dose, 4,800 *r*.

The only modifications of this were at Saint Vincent's Hospital, where Coolidge tubes were used in 1928.

Material Available for Study.

The total number of cases available for study was 76. Seven were discarded because the patients could not be traced. Eleven were discarded because no pathological reports were available, but in each there was definite clinical evidence of carcinoma.

The total for study was 58 cases with pathological reports, together with 11 cases that were clinically malignant, making a total of 69 for general study.

The cases are grouped according to the classification of the League of Nations into Stages 1 to 4, as follows: Stage 1, 11 cases; Stage 2, 16 cases; Stage 3, 16 cases; Stage 4, 15 cases.

The recurrence after hysterectomy is shown in Tables II and IIA.

TABLE II.

Stage.	Case Number.
2	II 6
3	III 18
4	IV 17
4	IV 16
4	IV 21

Cancer of the Cervical Stump.

Stage.	Remarks.	Case Number.
2	No pathological report	II 20
3	Two cases	III 11 and 19

TABLE IIA.

Primary Cases.

Group.	Number of Cases.
1	11
2	14
3	13
4	12
Recurrence after hysterectomy ..	5
Cancer of the cervical stump ..	3
Total satisfactory for study ..	58

In Table III the results of treatment in different classes of cases are shown. The standard of cure is five years or more life since treatment, together with absence of any sign of recurrence at the time of writing.

TABLE III.

Results of Treatment in Different Classes of Cases.

76 cases, *less* 7 untraced = 69 cases.

Stage.	Cases.	Cures.	Percentage.
1	12	4	33
2	21	6	28
3	18	3	16
4	18	1	5
Total ..	69	14	Average 20%

In Table IIIA are shown the results of treatment in all cases in which pathological reports were available. In Table IIIB are shown the types of treatment used in "cured" cases. "Cured" means that the patient is alive and well after five years or more.

TABLE IIIA.

Results of Treatment in all Cases which have Pathological Reports.

Stage.	Cases.	Cures.	Percentage.
1	11	4 (I 6, I 8, I 10, I 13)	36·0
2	16	6 (II 2, II 4, II 6, II 11, II 16, II 21)	37·0
3	16	3 (III 9, III 10, III 19)	18·0
4	15	1 IV 13	6·6
Total ..	58	14	25·0

TABLE IIIB.

Treatment used in "Cured" Cases.

Stage.	Number of Cures.	Method and Group, with Case Number.	Period of Survival.
I	4	Panhysterectomy .. I 6, I 10	6 years
		Radium + panhysterectomy I 13	6 years
		Radium .. .. .. I 8	
II	6	Panhysterectomy .. II 2	12 years
		II 4	9 years
		II 11	7 years
		Radium + panhysterectomy II 16	5 years
		II 21	5½ years
		Radium after panhysterectomy .. II 6	8 years
III	3	Radium + panhysterectomy + deep X ray therapy III 9	5½ years
		Radium + deep X ray therapy .. .. III 10	5½ years
		Radium .. .. .. III 19	5 years
IV	1	Radium + deep X ray therapy .. .. IV 13	5½ years

TABLE IV.

Number of Years Elapsed in Cured Primary Cases.

Method of Treatment.	Period in Years.						Total.
	5 to 6	6 to 7	7 to 8	9	11	12	
Hysterectomy	1	2	—	1	—	1	5
Radium and hysterectomy	2	—	—	—	—	—	2
Radium	1	1	—	—	—	—	2
Radium and X rays ..	1	2	—	—	—	—	3
Radium *plus* hysterectomy *plus* X rays..	—	1	—	—	—	—	1
Hysterectomy and radium	—	—	—	—	1	—	1
Total years ..	5	6	—	1	1	1	14

Summary.

1. A series of 69 cases drawn from the practice of one surgeon, of which 58 are supported by pathological examination of the tissue and the remaining 11 are clinically undoubtedly cancer of the cervix, are presented. The cases are carried to a minimum follow-up of five years, and an actual period of twelve years in some cases. These permit the following conclusions:

2. There were 69 patients reported in all, of whom 14, or 20%, are alive and free from recurrence; or taking only those in whom a pathological examination is available, there are 58 patients reported, of whom 14, or 25%, are alive. Note that there is a pathological report available for every surviving patient. In all the successful cases treatment consisted of radium or hysterectomy or a combination of the two methods. In three cases radium was used with deep X ray therapy.

3. The results of treatment in all cases for which pathological reports are available show results as follows, namely: In stage 1, out of 11 cases there were four cures, or 36%. In Stage 2, out of 16 cases there were six cures, or 37%. In Stage 3, out of 16 cases there were three cures, or 18%. In Stage 4, out of 15 cases there was one cure, or 6·6%. All these 14 patients are available for examination by independent investigations.

4. Of the 14 patients "cured", five were treated by panhysterectomy, three by radium followed by panhysterectomy, and one by radium followed by

TABLE V.

Showing Results of Treatment in Different Stages.

(Based on figures of Table III.)

Method of Treatment.	Cases.	Cures.	Percentage.
Stage 1: Total Cases, 12			
Hysterectomy (post-operative fatality, 1)	6	2	33
Radium	5	2	40
Radium and deep X ray therapy	1	—	—
Stage 2: Total Cases, 21			
Hysterectomy[1] (post-operative fatalities, 4)	10	3	30
Radium[2]	5	—	—
Radium and X rays	1	—	—
Radium and hysterectomy ..	2	2	100
Radium and hysterectomy and deep X rays	1	—	—
Hysterectomy and radium ..	1	1 (11 years)	100
Diathermy	1	—	—
Stage 3: Total Cases, 18			
Hysterectomy (post-operative fatality, 1)	3	—	—
Radium[3]	5	—	—
Radium and X rays	4	2	50
Radium and hysterectomy (post-operative fatality, 1) ..	1	—	—
Radium and hysterectomy and deep X rays	1	1	100
Diathermy	3	—	—
Diathermy and X rays ..	1	—	—
Stage 4: Total Cases, 18			
Hysterectomy (post-operative fatality, 1)	1	—	—
Radium	4	—	—
Radium and X rays	7	1	14
Diathermy	5	—	—

[1] This group includes six patients who were treated with diathermy before hysterectomy; two were regarded as cured.

[2] This group includes one patient who had diathermy before radium treatment.

[3] This group includes two patients who had diathermy before radium treatment.

TABLE VI.

Showing Duration of Life of Patients not Cured.

Treatment.	Cases.	Period in Months.	Remarks.
Stage 1			
Hysterectomy alone	4	1 post-operative	0
		1	36 Recurrence.
		1	24 Secondary in liver.
		1	18 Secondary in lung.
Radium ..	3	1	14 Recurrence.
		1	3 Pulmonary embolus.
		1	13 Recurrence.
Radium and X rays	1		14 Recurrence.
Stage 2			
Hysterectomy alone	7	1–60	Recurrence.
		1–6	Recurrence.
		1–24	Secondaries.
		3 post-operative	
		1–72	Recurrence.
Radium ..	5	1–4	Uræmia. No recurrence.
		1–48	Cerebral thrombus. No recurrence.
		1–8	Secondaries.
		1–20	Recurrence.
		1–20	Uræmia. No recurrence.
Radium *plus* X rays	1	1–27	No recurrence.
Radium and hysterectomy and X rays	1	1–25	Secondaries.
Stage 3			
Hysterectomy alone	4	1–8	Recurrence.
		2 post-operative	
		1–36	Secondaries.
Radium ..	5	1–14	Recurrence.
		1–15	Recurrence.
		1–26	Pyonephrosis. No local recurrence.
		1–5	Recurrence.
		1–3	Secondaries.
Radium and X rays	2	1–40	Recurrence.
		1–17	Recurrence.
Stage 4			
Hysterectomy ..	1	Post-operative	
Radium ..	4	1–59	Secondaries and no local recurrence.
		1–36	No local recurrence (senile).
		1–28	Recurrence.
		1–18	No recurrence. (Heart failure.)
Radium and X rays	6	1–16	Recurrence.
		1–14	Recurrence.
		1–5	Recurrence.
		2–20	Recurrence.
		1–24	Recurrence.

TABLE VII.
Showing Radium Dosage (Local) in Cured Cases.

Stage.	Years.	Dose in Milligramme Hours.	Remarks.
1	6	1,800	
	5	2,200	*Plus* hysterectomy.
2	6	2,640	*Plus* hysterectomy.
		2,500	
	5	4,000	*Plus* hysterectomy.
	8	1,200	*Plus* X rays.
		1,200	
3	5½	2,000	
		1,800	*Plus* X rays.
	5	412	
		3,000	*Plus* X rays.
		3,600	
		3,000	
	5½	1,248	*Plus* hysterectomy and X rays.
4	5½	1,008	
		1,500	*Plus* X rays.
		3,000	
		1,200	

panhysterectomy and then deep X ray therapy; while one was treated by panhysterectomy in 1923, had a recurrence in 1926, which was treated by radium, and has remained well since. That is, 10 of the 14 had a panhysterectomy. The remaining four were treated by radium, and of these two had deep X ray therapy following the radium.

5. Of the "cured" patients, four were in Stage 1 and six were in Stage 2. Only three were cured in Stage 3 out of 18 cases, and one in Stage 4 out of 18 cases.

6. As regards duration of life in those cases in which the patient died since treatment was instituted, it is shown that in Stages 1 and 2 those treated by hysterectomy had a longer survival period than those treated by radium, while in Stages 3 and 4 radium or radium with deep X ray therapy gave longer life and more comfort.

7. In the period covered by this paper the experience of surgeons in Australia with radium treatment was very limited. The Commonwealth radium was made available only in 1928, the last year covered by this report, and the screenage available was very low. Prior to that a small amount of radium only was available from private sources. Since 1928 the screenage has been increased in conformity with modern practice.

8. It is to be noted that four patients in Stage 2 treated by radium died from other causes, with no local recurrence or secondary growth, one after four years, one after two and a quarter years, one after two years, and one after four months. These patients remained clinically free from malignant disease till their death. One patient survived five years after hysterectomy before dying of recurrence. In Stage 3 one patient survived for twenty-six months without any recurrence and died of pyonephrosis. *Post mortem* examination showed that the uterus was quite free from malignant disease. In Stage 4 one survived eighteen months without recurrence and died of heart failure, and one for three years without recurrence and died from senile causes.

Results Obtained Abroad.[1]

In order to give a standard of comparison, the following figures are quoted from recent papers by surgeons and radiotherapists abroad.

Friedrich Voltz, writing in *The British Medical Journal* of November 19, 1932, bases his article on the results and methods of the Radiologic Institute of the gynæcological clinic of the Münich University. From 1913 to 1926, 1,723 patients were treated by radiotherapy. Of these, 319 patients were alive and well after five years—18·5%. Of 404 patients treated for cervical carcinoma during the years 1924-1926, 97 patients (24%) were alive and well five years later.

J. Heyman, from a study of all available literature for the results of operation during the same three years, gives a cure rate for the whole material at 24%; for Group 1, 49·4%; for Groups 1 and 2 combined, 37%. For patients submitted to operation the absolute cure figure is 19·1%, the relative cure figure 35·6%.

Döderlein's figures from the clinic show a primary mortality from radiotherapy of 0·8%.

Heyman's figures for radical operation are 17·2%. Radiotherapy in Group 3 (inoperable cases) gave a five-year cure rate of 17·9%, and in Group 4 (incurable cases) one of 4·9%. The percentage of patients who can be treated by radiotherapy is 96·7; an average figure for operability is only 64%.

Lincoln Davis, reporting in *Surgery, Gynecology and Obstetrics*, February 15, 1933, reports complete records of 65 women who had microscopically proved cancer of the uterus and who survived treatment for at least five years without signs of recurrence. Thirty-four had carcinoma of the cervix, and of these 23 were submitted to radical hysterectomy and 11 were treated by radium. Radium began to be used in 1925, at first only for advanced cases of carcinoma of the cervix. Gradually it supplanted radical operation in the treatment of more favourable cases, and since 1925 only two radical Wertheim operations have been performed. In 1925 there were 15 cases of carcinoma of the cervix treated with radium, with five five-year "cures". In 1926 there were 24 cases with two five-year "cures"; in 1927, up to September, 25 cases with four five-year "cures".

Friedrich Voltz, writing in *Radiologische Rundschau*, June, 1932, reports the result of treatment carried out in the years 1924, 1925 and 1926; adding these to his previously published statistics, starting with 1913, he now disposes of 1,723 cases. At the end of five years 319 patients, or 18·5%, were living and well; in Group 1 there were 141 (43·2%); in Group 2, 90 (22·5%); in Group 3, 81 (12·1%); and in Group 4, 7 (2·1%). In the three

[1] I am indebted to the 1933 "Year Book of Radiology" for this summary.

years 1924-1926, 404 cases of cervical carcinoma were treated. Ninety-seven patients were alive and well at the end of five years—24%. These consisted of Group 1, 49 (49·4%); Group 2, 21 (23·1%); Group 3, 23 (17·9%); and Group 4, 4 (4·9%).

Victor Bonney, writing in *The British Medical Journal* of November 19, 1932, reports the results he has obtained by Wertheim's operation. Between 1907 and 1927 this operation was done 339 times. The operative mortality rate is 15·3%, the relative cure rate 38·9%. Invasion of the regional glands was present in 143 cases. Thirty-one, or 21·6%, patients died of the operation; five years after operation 34, or 23·7%, were well. When the glands were not involved there were 21 deaths from operation (10·7%) and cures 98 (50%). The presence of growth in the regional glands about halves the chance of cure. From his experience Victor Bonney finds that five years' freedom from recurrence is only 90% cure, for about 10% of all recurrences take place between the fifth and tenth year after operation. Between 1907 and 1931 Bonney has performed 428 operations; the operative mortality has fallen steadily from 20 deaths in the first 100 (20%) to 12 in the last 128 operations (9%).

Lacassagne, writing in *The British Medical Journal* of November 19, 1932, reports that between 1919 and 1926 the total number of patients treated at the Institut du Radium of Paris was 678; of these, 182 (26%) were alive and free from all symptoms of cancer five years after treatment. From 1924 onward it has tended to become the rule to reinforce intrauterine radium treatment by external irradiation in cases in which a malignant invasion of the parametrium was present. The comparative results are given for two four-year periods. In Stage 1 there was a total of 52 cases: in 30 cases treated during the first period there were 10 cures (33%); of 22 patients irradiated during the second period, 19 are well after five years (86%). In Stage 2 there was a total of 200 cases: 104 patients treated in the first period gave 28 cures (26%), 96 treated in the second period gave 41 cures (42%). In Stage 3 there was a total of 263 cases: 111 patients treated in the first period gave 9 cures (8%); 152 treated in the second period gave 46 cures (30%). Many patients come for advice the first time when already suffering from Stage 4 lesions; the statistics of these cases number more than 12%.

Professor Regaud, of Paris, writing in the *Bulletin de l'Académie de Médecine* of May 3, 1932, reports his results in totals and percentages over the last two periods, 1922-1927. Of 588 patients treated, 52 were in Stage 1, and 29 were claimed to be cured (55%). There were 200 Stage 2 patients, of whom 69, or 34%, were cured; 263 Stage 3 patients, of whom 55, or 20%, were cured; and 73 in Stage 4, of whom one, or 1%, was cured. This is, of course, after treatment by Regaud's method of radiotherapy.

MALIGNANT TUMOURS OF THE OVARY.[1]

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Honorary Radiotherapeutist, Saint Vincent's Hospital, Sydney.

At the Cancer Conference held at Canberra in 1933 we made a preliminary and short report of the results of treatment of cancer of the ovary by deep X rays.

We now propose to present a report of forty-six cases treated by us either by deep X rays alone or by deep X rays combined with surgery. This work has been carried out for the most part at Saint Vincent's Hospital, Sydney. Wherever it has been possible the diagnosis has been confirmed by pathological examination of tissue.

Literature on the Subject.

Some extracts from the literature concerning the pathology and clinical aspects of malignant tumours of the ovary are given as an introduction to our report.

Ewing,[(1)] writing about papillary serous adenocarcinoma, states that a considerable proportion (50%) reveal adenocarcinomatous structure in at least some portions of the growth, but that most of such tumours, being encapsulated, are successfully removed. The typical malignant tumour is adenocarcinomatous throughout, and its variations extend towards alveolar and diffuse carcinoma. There is little doubt that many of the former group represent malignant transformations of more typical adenomata. The tendency of papillary adenomata in other regions to become carcinomatous, the occasional occurrence of adenoma in malignant form, the frequent mingling of benign and malignant areas in the same tumour and the association of adenocarcinoma in one ovary with adenoma in the other, all indicate that ovarian adenomata are to some extent specially prone to malignant change. The papillary adenocarcinoma is usually cystic, but the cysts are smaller and less numerous than in adenoma, the inverted tumour masses are larger, and much of the tumour is solid. The finely honeycombed texture of pseudomucinous adenocarcinoma is missing.

Some malignant tumours are pedunculated and movable like the adenomata, but a larger proportion is intraligamentary or bound by adhesions. The cyst contents are seldom clear, since degenerating epithelial cells are thrown off in large numbers and small hæmorrhages discolour the fluid

[1] Read at the Fifth Australian Cancer Conference, Canberra, April, 1934.

brownish. The capsule is commonly perforated and papillary growths cover portions of the surface and invade the peritoneum.

The tumours are frequently bilateral (66%) and the malignant structure may be more advanced on one side. Only a small proportion of these bilateral tumours can be referred to implantation.

The course of ovarian papillary carcinoma, while slower than that of other varieties, is unfavourable because of local recurrence after apparently complete extirpation, intraligamentary position, early peritoneal implantation, and later appearance of new tumour in the opposite ovary. The recurrence of papillary carcinoma is estimated at 83·3%, of other types of carcinoma at 66%. These data are contrasted with those of papillary adenoma, of which 16% recur. The glandular type recurs later, but more frequently than the papillary (95%). But observations on bilateral tumours vary greatly.

Malignant changes in previously benign pseudomucinous cystadenoma occur under several conditions:

(*a*) Implantations from a benign tumour develop in the stump, peritoneum, abdominal wall, or navel, and pursue a malignant course.

(*b*) *Pseudomyxoma peritonei* may develop malignant neoplastic tendencies and structure.

(*c*) In portions of benign cystadenomata the structure is malignant, but, being encapsulated, the tumour is completely extirpated.

All of these events are given as comparatively rare. The adenocarcinomata of these types still contain cysts, but large portions of the tumour are solid and present the opaque, cellular texture of carcinoma. The cysts represent natural cavities produced in the growth of the tumour and spaces of more ragged outline formed by degeneration and necrosis of central areas. Small hæmorrhages frequently occur. The mucus is greatly reduced in amount, but still persists in the small alveoli and spaces of the tumour. It is seldom clear, but more often discoloured by cell detritus and blood. The capsule is often perforated, adhesions form, implantations develop, and metastases occur in pelvic, retroperitoneal or inguinal glands.

Papers by S. J. Cameron and B. Macintyre,[2] in part of a symposium on ovarian tumours presented before the British Congress of Obstetrics and Gynæcology, give valuable data and conclusions. Macintyre writes:

> Ovarian tumours are of greater frequency in the unmarried than the married, and in the married there is a high sterility rate. The age incidence is the same for both benign and malignant tumours. There is a higher percentage of malignancy where there has been no pregnancy. The mortality rate in malignant epithelial tumours is very high, but granulosa cell cancers and malignant tumours of connective tissue origin have a relatively low degree of malignancy. The prognosis in malignant growths which are solid is more favourable than in the cystic varieties.

S. J. Cameron makes an analysis of 150 cases of cancer of the ovary and 19 cases of sarcoma. The ages of the patients vary from 17 to 74; but 52·2% occurred between the forty-fifth and sixtieth years. He writes:

> Parous women seem to be more liable than nulliparous; the percentage has been 57·2 and 42·8. In one-half of the cases the patient's attention was directed to the condition by the abdominal swelling. Pain is common. Uterine hæmorrhage was observed in 48·5 cases. Bleeding is common between the ages of 35 and 40. Ascites was present in 46% of cases. Removal of the tumour was impossible in 23% of the cases due to adhesions. Secondary growths were present in 20% operated on. Rupture of the cyst and torsion of the pedicle occurred in each instance in 7% of cases.

He adds:

> The surgical treatment of cancer of the ovary is disappointing. In most instances sole satisfaction must rest in the consciousness that a contribution has been made towards diminishing suffering in the later stages.

The average age of patients with sarcomata was 43, the youngest 22 and the oldest 65. Hæmorrhage occurred in 36·8%, amenorrhœa in only 15%. Pain was present in 84·2% and ascites in 26·3%. Removal was possible in only 57% of the tumours. The expectation of life was the same as in carcinoma of the ovary. The Krukenburg tumours and other secondary ovarian carcinomata have been the subject of much recent study. According to Frankl, metastases in the ovaries may be classified in three groups, according to the location of the primary focus: (i) Those which had no topical relation to the ovaries, such as mammary gland and thyreoid gland; (ii) those which have a partial topical relation, such as the stomach, adrenals and gall-bladder; (iii) those that have a close relation to the ovaries, such as the uterus, tubes and rectum.

J. M. Handley, junior,[3] collected 27 cases of secondary ovarian cancer at Johns Hopkins Hospital. Reviewing 11,200 consecutive autopsies, he was able to find 15 such tumours. The primary growth occurred as follows: cancer of the breast, five; cancer of the stomach, eight; of rectum, four; of large bowel, two; of gall-bladder, one; and of uterus, seven. He finds that 102 cases have been reported in the literature.

We have no case of Krukenburg tumours in our series, but reference to their pathology would not be amiss. They are usually bilateral, and usually occur with ascites, sometimes chylous. They grow to enormous size and end fatally by extension and recurrence. They used to be termed *fibro-sarcoma mucocellulare carcinomatodes*. The histological structure shows in all groups a diffuse growth of large polyhedral or rounded cells with mucoid contents compressing the nucleus into the characteristic "signet ring" form. The tumours are usually secondary carcinomata from stomach and other abdominal viscera.

B. M. Anspach and J. B. Montgomery[4] regard cancer of the ovary next to the uterus the most frequent site of malignant disease in the female genital tract. Bleeding is the uterine symptom most frequently mentioned, but any menstrual disturbance, including scanty periods and

amenorrhœa, may occur. Bleeding is of particular significance after the menopause. In 41% of the post-menopausal cases in their series, vaginal bleeding was the symptom for which the patients sought relief. "A malignant tumour of the ovary or tube should be strongly suspected if no lesion of the external genitalia or the uterus is found in a patient complaining of vaginal bleeding after the menopause." They advise that the abdomen should be opened and explored for diagnosis in all doubtful cases, and that in the early cases of carcinoma of the ovary the surgeon should extirpate the entire uterus and both adnexæ. In the late stage after exploratory incision as much of the malignant tissue as possible should be removed. The outlook is less favourable than in cancer of the uterus. "Deep Röntgen ray therapy", they say, "is now generally regarded as a valuable adjunct to the surgical treatment of ovarian malignancy."

W. Liepmann[8] writes:

> Carcinoma of the ovaries occurs more frequently than cancer of the body of the uterus. Every fourth ovarian tumour shows cancerous degeneration. Every ovarian tumour, irrespective of whether it produces symptoms or not, should be removed because of the danger of malignant change, and because of the danger of torsion of the pedicle. If more operations were performed for ovarian tumours, fewer women would die of cancer of the ovary.

Greenhill,[6] in reviewing this work, writes:

> Malignancy of the ovary is far more common than most physicians realise. It is well worth repeating that all tumours should be opened and wherever possible diagnosed during an operation rather than afterwards.

References occur in recently published communications as to the value of deep X ray therapy in cancer of the ovary. Herbert R. Spencer[7] in his review of 658 ovariotomies tells us that:

> The last word has not yet been written on the value of X rays and radium in curing or checking metastatic growths: but I have seen encouraging results.

William Healy,[8] of the Memorial Hospital, New York, states that radiotherapy has created for itself a field of the utmost value to the gynæcologist in the treatment of malignant ovarian conditions, and has changed the hopeless outlook to a more favourable one.

H. Wintz[9] gives the relative frequency of the pathological types of malignant growth of the ovary, as adeno-carcinoma, 32·2%; solid carcinoma, 20%; Krukenburg tumour, 6·6%; malignant degeneration of serous cyst adenoma, 29·1%; malignant pseudo-mucinous cyst adenoma, 8·4%; malignant degeneration of dermoid, 3·6%. The primary mortality rate from operation is given by Döderlien as 16%, by Schafer 17·1%, and by Mayer as 25%.

Wintz states that the primary mortality after operation is 15%. When the carcinoma is obviously operable, about 25% of the patients are cured. For all cases the proportion of cures is about 10%. Wintz believes that post-operative irradiation is followed by better results. He goes on to say that after incomplete removal when deep X rays have been used after operation, 40% of his patients are living after three years, and 25% after five years. He describes his technique. He gives his full dose of X rays in three days. Naturally he has his patients in hospital. He usually gives a second course in six to eight weeks, and sometimes a third course later on.

Nelson B. Sackett[10] states that in the field of gynæcology the rivalry between the surgical and the irradiation schools is giving way to a systematic combined therapy for the majority of cases, with certain cases selected on grounds of medical condition, operative technical suitability, and histological structure, for surgery or radiation alone. All patients with ovarian tumours, regardless of age, symptoms, presence or absence of ascites, should be operated on. If malignant change is found, both adnexæ should be removed with the *corpus uteri* and all removable secondary growths. X radiation after operation and for inoperable cases is now being carried out by him according to Coutard's technique.

Paul Petit-Dutaillis[11] discusses the treatment of ovarian cancer and considers the advisability of a preliminary trial by radiation, pre-operative, pharmacological and psychic measures, and the post-operative use of X rays.

F. J. Gwynne,[12] from Auckland, New Zealand, in 1930 suggested partial resection of the ovarian growth followed by deep X ray therapy. He says that in work done prior to 1927 he noticed that cancer of the ovary could be treated by X rays with encouraging results.

W. Blair and M. M. Datnow[13] state that enough has been said to show that in all operable cases surgical treatment has the foremost place. But they draw attention to the fact that surgery, like radiology, has but a local application. They go on to say that radium, in their opinion, has no place in the treatment of this disease, and that X ray treatment does more harm than good; but they do not give any particulars as to the number of cases treated, and neither dosage nor technique is even mentioned.

F. R. Smith[14] reports three cases of carcinoma of the ovary treated by irradiation. The first patient remained well for a year before pelvic recurrences developed. In the second case no attempt was made to remove the tumour, but treatment resulted in complete regression, and the patient is well four and a half years later. In the third, exploratory operation showed the growth to be so extensive that only X ray treatment was given over a period of two years, after which a papillary ovarian cancer was removed. Irradiation treatment was continued and the patient is free from signs and symptoms seven and a half years later.

Malcolm Donaldson,[15] in his recent book on radiotherapy in the diseases of women, published

last year, encourages us by saying that there is considerable evidence that deep X ray therapy has an effect on malignant tumours of the ovary. For instance, ovarian tumours which have advanced to such an extent as to make their removal impossible have been treated with X rays and found to diminish in size. Patients have been kept alive for several years and, although the tumour has not entirely disappeared, its malignant characteristics seem to have been destroyed. He asserts that it seems reasonable to treat by X rays every case in which malignancy is known to have existed, in the hope of destroying any isolated cells that may have become deposited in the pelvis during operation.

As time has progressed there has been rapid improvement in surgical and X ray technique, and we have not remained stationary in our work for the sake of statistics, but have altered our methods according to suggestions by physicists after research. We believe that the improved techniques give greatly improved results; but we give our results good and bad, as they are, because statistics cannot give the same mental picture as regular contact with patients. Our attitude of mind after seeing many of our patients return to work is one of hope, almost of optimism.

Technique.

Surgery.

We hold that every patient should be given the benefit of laparotomy with removal of the whole or part of the tumour, unless her condition is so grave that it is clear that she would not survive a laparotomy. The surgical dictum still holds that the tumour should be removed *in toto*, without tapping, as the spilling of cancerous material is liable to cause recurrent growth. The length of the incision necessary should not influence the surgeon's mind. Considerable judgement is necessary in large and adherent tumours, especially the judgement to know when to stop. Such serious and uncontrollable hæmorrhage may occur that the patient may die on the table. Deep X rays alone should be used for these patients. The operation of election is removal of the tumour with the opposite tube and ovary and the uterus. In our experience when this procedure has been followed, even when malignant cysts have ruptured and malignant tissue has still been present in the pelvis after operation, the patients have done well after deep X radiation, and still remain apparently free from disease. When a laparotomy has been done, portions of the original growth if possible, and of secondaries if present, should be removed for biopsy.

If a patient's condition is grave at the time of operation, a surgeon may have to content himself with removing the tumour only. Every cyst of the ovary which contains thick discoloured mucinous material should be suspect, and should be carefully examined by a pathologist of experience. In every case in which there is cancerous tissue, a full course of X rays should follow at the earliest safe moment. It is a common experience that patients from whom malignant ovarian tumours have been removed, frequently go down hill very rapidly after operation. We have seen this stage of rapid decline arrested by deep X ray therapy. This is exemplified by Case XVII in our series.

In this patient the large cyst alone was removed on account of the patient's low state. Her wound healed quickly and she had no surgical emergencies during convalescence. The third week of convalescence showed her weakening, with an increasing pulse rate and lowering blood pressure. The skin took on a greyish tinge, and she had the anxious expression of one about to die. Deep X ray therapy was commenced at this stage, with strikingly beneficial results.

Patients with ascites who are not subjected to operation should have *paracentesis abdominis* done before application of deep X rays. Naturally the effect of the rays is increased by the removal of fluid.

Irradiation.

It is routine practice today with patients at Saint Vincent's Hospital to bring them to the X ray department as soon as they are able to leave the ward after operation. We give 1,600 *r* to two anterior and two posterior pelvic-abdomino fields in 200 *r* daily, omitting Saturday and Sunday. We deliver this dose through two millimetres of copper at 50 centimetres focal skin distance with 15 milliampères of current at a kilovoltage of 200, and regard it as absolutely necessary to irradiate the entire abdomen. We repeat this course in three to four months, even if no clinical abnormality is present. If recurrences or metastases occur during or after this period, we give up to 2,400 *r* through three millimetres of copper, the other above factors remaining the same. If we think it necessary, three or four months later we give a third course similar to the second. With this technique the patient does not experience the stages of skin erythema, but proceeds in fourteen to twenty-one days to a dark brown pigmentation with fine desquamation. Also we are now able to avoid "radiation sickness", which in the past has always been the greatest deterrent to delivering an adequate dose to these large pelvic tumours. We are now giving intramuscular injections of liver extract in doses of two cubic centimetres two to three times a week, as indicated by the degree of nausea the patient is suffering. Our experience agrees with that of J. H. Douglas Webster[17] in that so far it has brought only success, and we feel that radiotherapy now is rid of its two big terrors for the patient, namely, "burning of the skin" and "sickness"; and there is now every possibility that a proper dose lethal to the cancer cells can be delivered.

Case Histories.

CASE I.—A.R., married, aged fifty-three years, for nine or ten years noticed a small swelling in the lower part of the abdomen, which gradually became larger and increased during menstruation. At times it appeared to obstruct the flow of urine. It had gradually become larger and had increased to the size of a full time pregnancy. Laparotomy was performed on July 3, 1933. A large tumour was found occupying the whole of the

pelvis and most of the abdomen. Apparently it came from the left ovary, with dense adhesions between the tumour and the pelvic walls. X radiation was commenced on July 31, 1933. On December 8, 1933, the abdomen was still enlarged to about the size of an eight months' pregnancy and the patient was feeling and looking better. X ray treatment was continued until October 24, 1933. In March, 1934, the patient's abdomen was enlarged to the size of a six months' pregnancy, but she felt comfortable and stated that she had not felt better for years. We have prescribed another course of X rays through three millimetres of copper, and we are optimistic enough to believe that the growth has been arrested and that this patient will be kept in comfort for some time to come. She is now carrying out her work as a laundress, and is cheerful, her only inconvenience being the size of the tumour.

CASE II.—E.P., married, aged thirty-seven years, complained of an abdominal tumour occupying the whole of the lower half, extending to 3·75 centimetres (one and a half inches) below the umbilicus. A fixed hard mass was present in the pouch of Douglas. Laparatomy was performed in June, 1932. Biopsy revealed adenocarcinoma of the ovary. X ray therapy was commenced on July 11, 1932. On December 12, 1932, the patient developed carcinoma of the left breast with enlargement of the axillary glands. A second course of X ray treatment was finished on March 23, 1933. This was followed up by a course of treatment to the breast and glands. The patient was kept in moderate comfort until September, 1933, when she started to relapse and the abdomen filled up with fluid and she died in October, 1933.

CASE III.—F.F., married, aged fifty-one years, had complained for nine months of incontinence of urine. Examination revealed a large tumour pressing on the bladder. On September 14, 1932, operation was undertaken and a large multilocular cyst of the left ovary and a smaller cyst of the right ovary were removed. Subtotal hysterectomy and double salpingectomy were performed. The left ovarian cyst was attached to the uterus and adnexa and extended into the bladder and parietal peritoneum. On October 17, 1932, there was a hard mass in the left fornix and a lesser mass in the right fornix; no fluid was present. She commenced her X ray treatment on October 25, 1932, and, finishing on November 16, 1932, she was free from signs or symptoms until March 15, 1933, when masses appeared in the upper part of the abdomen outside the previous field of radiation. The irradiation was completed to the upper part of the abdomen on April 13, 1933. The masses disappeared and she remained well until August 17, 1933, when her abdomen filled up with fluid and the masses in the lower part of the abdomen returned. A *paracentesis abdominis* was done and irradiation was continued until October 30, 1933, when her general condition began to fail; her abdomen filled up again with fluid and we realized that her condition had got beyond us.

CASE IV.—A.B., married, aged forty-five years, gave the history of ovarian cyst removed in Queensland eighteen years ago. For the last five years she has been having intermittent attacks of pain over the lower part of the abdomen, worse on the right side, and for twelve months she has been having severe flooding. In October, 1932, laparotomy was performed and carcinoma of the ovary was found with multiple diffuse metastases. On examination after operation she had a large fixed mass, the size of two fists, on the left side of the pelvis, extending to within 5·0 centimetres (two inches) of the umbilicus. Deep X ray therapy was commenced straight away. On April 10, 1933, she was looking and feeling very well. Nothing abnormal could be felt *per vaginam* or *per rectum* or in the abdomen, and she had put on 3·6 kilograms (eight pounds) in weight. In March, 1934, she had put on another 6·3 kilograms (one stone) in weight, and there was still nothing abnormal to be felt. We are giving another course of deep X ray therapy now for safety.

CASE V.—M.B., married, aged thirty-three years, in November, 1932, had a right tube and ovary and left tube removed. The left ovary was left because it appeared healthy. Ten weeks later a tumour had appeared on the left side. Then a subtotal hysterectomy was performed and the left side of the pelvis was cleaned right out; but several cysts were adherent to the rectum and were irremovable. She was sent for X ray treatment, which was finished on January 20, 1933. On April 4, 1933, the patient had gained 2·7 kilograms (six pounds) in weight and was free from signs or symptoms. On June 6, 1933, the patient had gained 4·0 kilograms (nine pounds) in weight. In March, 1934, the patient had gained 6·3 kilograms (one stone) in weight and was apparently entirely free from disease.

CASE VI.—E.R., married, aged sixty years, complained of vaginal bleeding and discharge for six months. Diagnostic curettage was done in December, 1933. Pyometra was found and the report on the scrapings from the uterus was "adenocarcinoma". She was seen by one of us for the first time three weeks afterwards, when she was found to be in a state of cachexia, with the abdomen distended with fluid. She was suffering great discomfort from pressure. The uterus was not enlarged, but two large, irregular, tender masses were felt in the pouch of Douglas adhering to the uterus and the abdominal wall. On January 14, 1934, a *paracentesis abdominis* was performed and 6·75 litres (one and a half gallons) of fluid were removed. The clinical diagnosis of bilateral malignant ovarian tumour was made. As the machine at Saint Vincent's Hospital was undergoing repairs, this patient's treatment was undertaken at Sydney Hospital by Dr. A. T. Nisbet, to whom we offer our thanks. At the same time Dr. Leslie Utz, after we offered our clinical diagnosis, kindly reported on the original slide as follows:

> There is evidence of an advanced malignant growth. The individual cell is totally unlike the cell forming the uterine acinus, and an excellent comparison can be made in this slide, as several more or less normal acini can be seen. The growth could quite easily represent a degenerative adenocarcinoma of the ovary. In fact, histologically, I think this growth fairly closely resembles the adenocarcinoma of the ovary.

At the time of this report, March, 1934, the patient is well and on pelvic examination no abnormality can be felt and there is no further collection of fluid. It is admitted that this is a short history, but at the time of first seeing her in January, 1934, one would give her the expectation of life of not more than three weeks, and now she is apparently quite well. This case further illustrates the point referred to earlier in this paper by the observations of various writers, that frequently the first sign of cancer of the ovary is bleeding from the uterus, and that a hopeless prognosis can be brought to a more favourable one by deep X ray therapy.

CASE VII.—E.J., married, aged seventy-six years, was operated on for tumour in the pelvis increasing in size. Double oophorectomy was performed on September 22, 1933, followed by X rays, the course being finished on December 6, 1933. In March, 1934, she was very well and there was nothing abnormal on examination. There was no pathological examination.

CASE VIII.—L.D., married, aged forty-seven years, on September 5, 1932, complained of nagging pain of two months' duration with a profuse white vaginal discharge. On September 6, 1932, an ovarian cyst was removed from the left side, also a fibroid from the uterus.

The histological report on September 6, 1932, was as follows:

> The calcified tumour is presumably a calcified fibromyoma. The ovarian cyst was received in an empty and collapsed state and is approximately 10 centimetres in diameter. Projecting from the outer surface at the same side is a white mass measuring 2·0 by 2·0 centimetres and raised 0·5 centimetre above the surface. Situated close to this area is another outward projection measuring 4·0 by 3·5 centimetres and 1·0 centimetre in thickness in its thickest part. The grade of malignancy appears to be rather high, but this is difficult to determine with certainty. The masses described in the naked eye description are definitely cancerous.

She was given two courses of deep X rays, but her general condition became steadily worse and she died on December 12, 1933, from multiple abdominal metastases with ascites.

CASE IX.—E.R., married, aged fifty-two years, was operated on on April 17, 1933. An incisional hernia was repaired, subtotal hysterectomy, double salpingo-oophorectomy, division of peritoneal adhesions and appendicectomy were performed.

The pathological report was bilateral adenocarcinoma of the ovaries. Deep X rays were given and the course was finished on June 20, 1933. The course was repeated in October, 1933, and repeated again in March, 1934. The patient in March, 1934, was very well and had no signs of disease.

CASE X.—P.C., single, aged thirty-two years, on March 19, 1931, had double oophorectomy for a right ovarian cyst, and secondary deposits were seen in the omentum at the operation. Deep X rays with a screen of two millimetres of copper were given and the course was finished on June 24, 1931. At all subsequent examinations she was well, until early in 1933, when she married and has not reported since.

CASE XI.—S.P., married, aged fifty-eight years, complained of pain in the pelvis for six months. On April 5, 1933, a large left ovarian cyst was removed. The pathological report was that adenocarcinoma was present in the solid portion of the tumour. She developed large recurrence and metastases, and then deep X ray, finishing on July 7, 1933, was given. On examination on September 29, 1933, nothing abnormal could be felt. No abnormality was found on December 1, 1933, but it was deemed advisable to give another course for safety.

CASE XII.—E.L., married, aged fifty-four years, had her right ovary removed on February 7, 1932. The pathological report was: "Adenocarcinoma of the solid type". She was immediately sent for deep X ray therapy, which was finished on April 20, 1932. She has remained quite free from recurrence or metastases, and in March, 1934, was in excellent health.

CASE XIII.—M.P., married, aged sixty-three years, had double oophorectomy and hysterectomy performed in February, 1933, for cystic ovaries. The pathological report was cystic adenocarcinoma. Deep X rays were given and were finished in May, 1933. She was still alive and free from disease in March, 1934.

CASE XIV.—H.G., married, aged sixty-four years, had a right ovarian cyst removed in April, 1931. The pathological report was papilliferous cystadenoma. In July, 1931, she developed a secondary mass in the left side of the pelvis. She then had deep X rays through one millimetre of copper, and remained well until June, 1932. Since then she has not been traced.

CASE XV.—J.W., single, aged forty-five years, in July, 1933, was operated on for an increasing tumour of the pelvis and abdomen. Partial removal of a bilateral ovarian cyst was undertaken; most of the pelvic growth was left. The pathological report was adenocarcinoma of both ovaries. X ray therapy was given immediately, the first course finishing on November 2, 1933, after which the tumour masses became very much smaller. Another course was finished on February 15, 1934. The patient is comfortable, but there is still a mass to be felt in Douglas's pouch. At no time has there been any free fluid.

CASE XVI.—A.B., married, aged fifty years, was operated on on July 31, 1930, for increasing swelling in the abdomen. Subtotal hysterectomy (the uterus contained fibroids), double oophorectomy, and excision of a cyst in the broad ligament were performed. The pathological report was:

> Left ovary shows chronic oophoritis and presence of several small epithelial follicular carcinomatous cysts. Right ovary shows compound cyst adenoma with carcinomatous change.

On August 11, 1930, she was sent for deep X ray therapy and on September 5, 1930, nodular masses were palpable in the right loin. Further X ray therapy was given, the course being completed on September 25, 1930. She has reported regularly since, and has remained free from any further signs or symptoms of recurrences or secondaries. She is at present engaged in hard manual labour as a farm worker.

CASE XVII.—R.C., married, aged fifty years, in April, 1933, had an operation performed because she complained of a large swelling on the side of the pelvis. The mass, an ovarian cyst, was removed. The uterus and other pelvic organs were not removed because the general condition of the patient would not permit. The peritoneum was seen to be studded with sago grain granules. She was given a course of deep X rays according to the existing two millimetres of copper technique, the course finishing on June 22, 1933. On examination on August 22, 1933, the patient was well and had put on weight.

The pathological report was adenocarcinoma of the ovary. It is now proposed to remove the rest of the pelvic organs and to follow this by further X ray treatment.

CASE XVIII.—M.B., single, aged thirty years, in April, 1930, complained of pain. A right ovarian cyst was removed and was ruptured during the operation. The pathological report was adenocarcinoma. She was referred to the deep X ray department on May 28, 1930, two weeks after operation, because of large recurrent masses in the abdomen and a desperate clinical condition. She did not appear to have very strong union in the tissues beneath the abdominal scar, so a lead screen was placed over the scar to prevent destruction of the new repair cells. The size of the screen was 5·0 centimetres (two inches) wide by 15·0 centimetres (six inches) long. When she was seen on August 11, 1930, after her course of deep X rays, the pelvis and abdomen were free from growth, but there remained an area of growth underneath the whole length of the wound for a length of 10·0 centimetres (four inches) and about 3·75 centimetres (one and a half inches) wide. A further course of deep X rays was applied to this area and the rest of the abdomen was screened. The linear mass disappeared. The set of circumstances makes her case particularly interesting from a radiotherapeutic point of view. A further course was given in February, 1931, for safety. She was married in 1933, and in March, 1934, she was very well and free from growth.

CASE XIX.—E.G., married, aged fifty years, in January, 1931, had a subtotal hysterectomy *plus* removal of a left ovarian cyst. The pathological report was as follows:

> Multilocular cyst containing straw-coloured fluid. Half the cyst was taken up with solid yellowish growth. Sections of the latter show solid masses of adenocarcinomatous cells, which in places are infiltrating the fibrous stroma.

She finished her course of X ray treatment on March 19, 1931, through one millimetre of copper. In March, 1934, she was free from any signs and symptoms of disease.

CASE XX.—A.W., married, aged fifty years, had an abdominal section on October 28, 1931, for fibroids and ovarian tumour, which were completely removed. Examination revealed "neoplasm, mainly complicated papilliferous processes of neoplastic epithelium with extensive areas of necrosis". X ray treatment was finished on April 8, 1932. In March, 1934, the patient was free from any signs and symptoms of the disease. It is interesting to note the time factor between operation and X ray treatment.

CASE XXI.—A.W., married, aged fifty years, had two operations in fourteen months for "ovarian cysts". On examination on July 11, 1932, she had a boggy feeling throughout the abdomen, with pain up under the liver, but no definite masses were felt. At operation she had peritoneal metastases, and the pathological report was adenocarcinoma of the ovary. She finished her X ray treatment on August 24, 1932. In March, 1934, she was free from any signs or symptoms. She looks well and has put on weight.

CASE XXII.—J.O'S., married, aged forty-one years, was operated on on January 22, 1931, for "ovarian cyst" which

was infiltrating the wall of the uterus and adhering to the pouch of Douglas. There was also a large amount of free fluid in the abdomen. The pathological report was adenocarcinoma of the ovary with areas of necrosis. On examination on February 16, 1931, there was a small uterus, with a hard nodule present in the pouch of Douglas and quite fixed. She finished her X ray treatment through one millimetre of copper on March 18, 1931, and in June, 1932, she felt and appeared well and nothing abnormal was to be felt in the pelvis. Efforts to locate her since that date have been without result.

CASE XXIII.—D.A., married, aged thirty-five years, in May, 1928, had a large left unilocular ovarian cyst removed. In April, 1930, she was again operated on for a right ovarian cyst. There was found to be a large tumour extending on to the peritoneum, and there were sago grain nodules studded throughout. The mass was not completely removed, owing to a hæmorrhagic uterus which was involved in the mass, and there were smaller masses in the abdominal cavity. She finished her first course of irradiation on October 2, 1930, through one millimetre of copper. The preexisting mass on the left side had then disappeared, but there was still a boggy resistance in the right iliac fossa. A further course of irradiation through one millimetre of copper was completed on July 29, 1931. In March, 1934, we elicited the fact from her consulting surgeon that she was very well and free from signs or symptoms of the disease.

CASE XXIV.—M.McD., married, aged forty-eight years, in 1924 had a section for multiple bilateral papillomatous ovarian cysts. On September 17, 1926, she had a second section for the removal of multilocular cysts filling up the pelvis and abdomen. All were removed except those which were very adherent low down in the pelvis. On November 6, 1929, she had a third section for a mass filling up the whole of the pelvis, adherent to the bladder and rectum; but it was impossible to attempt any removal. She was then complaining of a watery vaginal discharge. She came to the X ray department on January 14, 1930, with masses palpable on both sides of the abdomen and pelvis, larger on the left side. She finished her course of X rays through one millimetre of copper on February 13, 1930. On June 17, 1930, the right-sided mass had disappeared; the left-sided mass was much smaller, and the patient was in very good general condition. She had another half course in May, 1930, and the masses receded still more. In November, 1933, she was free from any symptoms, but had a mass in the left side of the pelvis, hard and fixed. We recommended further X ray treatment with the newer technique, but the patient refused on the grounds that she felt perfectly well.

CASE XXV.—M.C., single, aged fifty-four years, was complaining of lassitude and loss of weight. A large abdominal tumour the size of a football was discovered, and at an operation on March 12, 1930, a double ruptured ovarian cyst was discovered, also several papillomatous growths on the surface of the cysts. One cyst had escaped and had become attached to the base of the appendix. Double oophorectomy and appendicectomy were performed. She finished her course of X rays on July 10, 1930, through one millimetre of copper, and her consulting surgeon tells us she is quite well.

CASE XXVI.—A.B., married, aged forty-four years, in May, 1929, had a left ovarian cyst removed and secondary nodules were noted on the peritoneum. The pathological report was as follows:

> Left ovarian tumour consists of a small multilocular cyst with superadded carcinoma encephaloid in places. Sometimes there is fibrous tissue reaction, and a scirrhous carcinoma is produced. Uterine scrapings show chronic hypertrophic endometritis.

She finished her course of deep X rays through one millimetre of copper on November 27, 1929. Last seen in June, 1932, she was quite well and free from any signs or symptoms.

CASE XXVII.—A.G., married, aged forty years, complained of bleeding *per vaginam* for four months. On June 10, 1931, she had a supravaginal hysterectomy. Her surgeon diagnosed her condition as fibroids *plus* a left ovarian cyst, which he removed as well. On her arrival at the X ray department on September 29, 1931, her abdomen was tense, hard and packed with growth. Her prognosis was deemed hopeless, but she was given one course of X rays, the course being finished on November 18, 1931. She steadily went down hill and died. The interesting part of this case is that pathologically and surgically her condition was not diagnosed as a malignant ovarian tumour.

CASE XXVIII.—H.T., married, aged fifty-five years, for ten weeks complained of intense pain in the left side of the abdomen. She admitted to intermittent attacks for the past two years. She had no discharge and no bleeding and had not noticed any abdominal swelling. On September 13, 1933, the operation of double oophorectomy was performed. The ovaries were cystic and multilocular, papilliferous, and slightly adherent to the surrounding tissue. Biopsy showed "early adenocarcinoma with degeneration in papilliferous cysts". A course of deep X ray therapy was finished on November 15, 1933. On March 19, 1934, she had no pain and no discharge. The uterus was free, there was no mass or tenderness in the fornices, no free fluid was present, no mass was felt anywhere by vaginal or rectal examination. She has put on weight and is very well.

CASE XXIX.—F.F., married, aged twenty-eight years, for three months noticed a swelling in the lower part of the abdomen which was gradually increasing in size, accompanied by shooting pains extending into the legs. Section was performed in August, 1933, and a large ruptured right ovarian cyst was removed. Biopsy showed it to be malignant degeneration in a pseudomucinous cyst-adenoma. A course of deep X rays was finished on October 24, 1933. In March, 1934, the pelvis was clear. The patient has put on weight and feels very well.

CASE XXX.—H.H., married, aged forty-seven years, complained of pain in the right iliac fossa for four months. She then noticed swelling of the lower part of the abdomen. Section was performed on March 10, 1933. Two huge ovarian cysts were partially removed, and there were secondaries seen studded all over the peritoneum. Section showed the presence of "adenocarcinoma, apparently arising from a papillary cyst-adenoma". A course of X rays was finished on May 22, 1933. In March, 1934, the patient was well, had put on weight and was apparently free from disease.

CASE XXXI.—E.P., married, aged forty-eight years, for eighteen months complained of severe floodings with pelvic pain and lassitude. On May 3, 1933, section was performed with double salpingo-oophorectomy. The pelvis was found to be filled with malignant ovarian tissue on both sides, stuck on to the pelvic wall, and a good deal of this tissue had to be left after operation. Examination showed her condition to be "gross malignant development in papilliferous cysts. Ovaries show adenocarcinoma". A first course of X rays was finished on October 30, 1933, when there was still a hard mass filling the pelvis and attached to the bone. A second course of X rays was given, being finished on March 6, 1934. The patient's general condition is failing and no more treatment is indicated.

CASE XXXII.—E.F., married, aged fifty-nine years, complained of blood-stained vaginal discharge. Laparotomy was performed in February, 1932. Biopsy revealed "adenocarcinoma of bilateral ovarian cysts". Malignant tissue was scattered throughout the pelvis and abdominal cavity, and the biopsy was taken from a large plaque of malignant tissue on the omentum. X ray treatment was commenced on April 13, 1932. She had only six of the course and disappeared completely. She was written to and asked to continue, and she finished her full course on August 5, 1932. In March, 1934, she was free from all signs and symptoms of disease.

CASE XXXIII.—V.B.D., married, aged fifty-one years, in 1930 had a cystic left ovary and tube removed. In April, 1933, the patient was seen and a large rounded mass was palpable in the right side of the abdomen, also quite

markedly enlarged lymph glands were present in the right and left cervical regions. Irradiation of all these areas was done and the tumours disappeared in September, 1933. In February, 1934, she had right nephrectomy performed owing to hydronephrosis caused by the ureter having been cut at a previous operation. The surgeon told us there was nothing abnormal otherwise to be found in the pelvis or abdomen than four very small, stony hard nodules at the site of the previous tumour. In March, 1934, she was apparently free from disease.

CASE XXXIV.—A.D., married, aged forty-one years, complained of a distended abdomen. No operation was performed. The condition was diagnosed as bilateral ovarian carcinoma with ascites. Fourteen pints of fluid were removed and large irregular masses throughout the pelvis and abdomen were revealed to palpation. A first course of X rays was given through one millimetre of copper, being finished on November 6, 1931. A second course through two millimetres of copper was finished on September 12, 1932. A third course was finished on July 11, 1933. Fluid became less between these courses. The patient reports back regularly, has no fluid, and is quite well at the present time.

CASE XXXV.—P.H., married, aged forty-one years, had a bilateral ovarian cyst removed in April, 1931. She came to hospital later and her condition was diagnosed as cancer of the cervix. Radium treatment was performed in June, 1931 (4,400 milligramme-hours). Some weeks after this laparotomy was performed for extensive recurrence of what was thought to be ovarian cancer in the pouch of Douglas; hysterectomy was not performed. The patient was then sent to the X ray department for the first time and was treated through one millimetre of copper, the course being concluded on August 21, 1931. She died in June, 1932, from abdominal metastases with ascites.

The following nine patients have all done particularly badly. They were all given a hopeless prognosis before treatment was commenced, but an attempt was made in each case to alleviate distress. Some responded temporarily, others just progressed, but we feel that we gave most of them some help.

CASE XXXVI.—A.B., single, aged fifty-one years, had an operation in June, 1932, for bilateral ovarian tumours. She noticed increasing abdominal swelling. The pathological report was "adenocarcinoma of both ovaries". No X rays were given. Recurrences were noticed in November, 1932, and X rays were ordered. Only half a course was given, as the patient was steadily growing worse. She died in January, 1933, from recurrences with ascites.

CASE XXXVII.—S.S., married, aged sixty-eight years, complained of pain in the left side of the pelvis for nine months; then, when troubled by cough, she sought medical advice in April, 1930. Then the abdomen was packed with growth accompanied by ascites. Two gallons of fluid were withdrawn. These tappings were frequently performed; the fluid became less in amount each time. Deep X rays were given through one millimetre of copper from December 16, 1930, to January 16, 1931. The growth was temporarily arrested and finally the patient died at the end of 1931.

CASE XXXVIII.—M.H., married, aged sixty-two years, had laparotomy performed in June, 1933, for increasing abdominal swelling. Biopsy was not taken and her condition was deemed quite inoperable. She finished her course of X rays on February 19, 1934, and died on March 5, 1934.

CASE XXXIX.—R.L., married, aged sixty-nine years, complained of increasing size of the abdomen for some months. At the time of examination, September 23, 1931, she had multiple hard masses all over the abdomen with free fluid. She was deemed hopeless, but was given the opportunity of a course of deep X rays, of which she had only a quarter of the course. She gradually went down hill and died.

CASE XL.—E.L., married, aged fifty-two years, noticed an increase in the size of the abdomen for six months. Laparotomy was performed in March, 1932. Biopsy revealed "papillary cyst-adenoma with widespread peritoneal dissemination". On examination on arrival at the X ray department in May, 1932, there was a large tumour reaching to the ribs on the left side and to the umbilicus on the right side; the tumour extended downwards, but was not fixed in the pelvis. No free fluid was present. She did not complete her course of deep X rays, and died in October, 1933, with secondary deposits throughout the entire abdomen.

CASE XLI.—S.R., married, aged sixty-eight years, complained of an increasing tumour in the pelvis. At the time of operation she had a tumour which reached above the umbilicus and out into both flanks. At the time of laparotomy it was found invading the parietal peritoneum, to which it was closely adherent and in which distinct nodules could be felt. X ray therapy was commenced on November 18, 1929, through one millimetre of copper. The patient steadily went down hill and died in January, 1930.

CASE XLII.—M.I., married, aged fifty-four years, was seen when in a very advanced stage with ascites and a large cystic tumour reaching to the xiphisternum. Laparotomy was not performed and her condition was desperate when deep X rays were commenced on September 14, 1932. She finished the course on October 4, 1932, and died two months later.

CASE XLIII.—M.W., married, aged seventy years, had a large tumour in the pelvis diagnosed clinically as a malignant ovarian tumour with ascites. One course of X rays was given in June, 1932. The patient steadily got worse and died six months afterwards.

CASE XLIV.—M.G., married, aged fifty-three years, for seven months noticed an increasing abdominal swelling which affected her appetite and caused shortness of breath. When first examined, she was inoperable and ascitic fluid was removed, and on microscopic examination numerous epithelial cells were found. X radiation was commenced on July 3, 1933, when she had a large fixed mass on the left side of the pelvis and of the abdomen, with a large nodule above the umbilicus, a great amount of free fluid, and definitely an inoperable mass; the prognosis was pronounced hopeless. A first course of X rays was finished on August 25, 1933. The patient stated that she felt better and the mass was definitely smaller. A month later her abdomen filled up with fluid and was tapped. A second course of X rays was completed on November 2, 1933. She had remained well until March, 1934. Her abdomen has again started to fill with fluid, is being tapped, and a third course of X rays has been recommended.

We have two cases only of ovarian sarcoma, but as one is very interesting, we have thought it best to include them in the series.

CASE XLV.—P.N., married, aged forty-six years, had been losing weight and had amenorrhœa for six months. She was sent for laparotomy on September 5, 1932. Biopsy only was done, which revealed sarcoma in an ovarian cyst. One X ray course was given, being concluded on November 23, 1932. The patient's condition did not improve; she gradually went down hill and died in June, 1933, from diffuse abdominal metastases. This patient was in a very advanced state, with a tumour reaching up to the xiphisternum, and she was in cachexia.

CASE XLVI.—C.D., married, aged fifty-six years, in October, 1931, was operated on for a chronic gastric ulcer with obstruction, and as she was in a very poor condition, only a posterior gastro-enterostomy was done. At the time a gall-stone was recognized, but was not touched, and a lot of glairy fluid was present in the abdomen, with a moderately large pelvic tumour. Her general condition improved, but she developed much free fluid in the abdomen, with an increasing pelvic mass. So six weeks later the abdomen was reopened. The peritoneum was full of glairy sago-like fluid, and the ovarian tumour was partially removed, but it had involved the bowel and

bladder. The pathological report was "myxo-sarcoma of the ovary with myxomatosis of the peritoneum".

When she was seen by us on February 1, 1932, there was a large mass palpable in the left fornix, extending to the rectum. On rectal examination this mass appeared to be extending from the sacrum forward and fixing the uterus. Deep X rays were given, the course being concluded on March 21, 1932. On examination on May 16, 1932, the uterus was quite movable, the mass had disappeared, but there was a small area of pelvic cellulitis surrounding the cervix. There was also profuse yellow discharge *per vaginam*. Just after this a strip of gauze was removed from an abscess which ruptured through the abdominal incision. One month later the cellulitis had partially subsided, leaving the cervix quite free. Later again a soft round mass was felt through the right fornix. Some weeks later she suddenly became very ill with abdominal distension and died from what appeared to be peritonitis.

Necessarily these cases are all recent, for the method of combined surgery and radiotherapy represents new work; but considering the very advanced stage at which many of these patients presented themselves, we consider the results we report are more than encouraging. We do not propose to make a final summary of results, because there are not sufficient patients treated five years ago to warrant it, but we append a table of statistics of what we consider interesting observations.

Acknowledgements.

We desire to acknowledge with gratitude the cooperation of members of the staff of Saint Vincent's Hospital, more especially in the pathological and the deep X ray department. We also acknowledge the interest and help of those surgeons who have sent patients to the clinic for treatment.

TABLE OF STATISTICS.

No Operation.	Laparotomy without Biopsy.	Laparotomy with Biopsy.	Complete Removal.	Partial Removal.	Rupture of Cyst.
7	4	2	15	16	2

Recurrence after Diagnosis of Innocence.	Secondaries Present at Operation.	Married.	Single.
2	20	42	4

Adenocarcinoma Cystic in Type.	Adenocarcinoma Solid in Type.	Carcinoma in Pseudomucinous Cyst Adenoma.	No Pathological Examination.
32	4	1	9

SYMPTOMS OR SIGNS FIRST NOTICED BY PATIENTS.

Tumour.	Bleeding or Discharge.	Pain.	Urinary Frequency.	Loss of Weight.	No History.
15	7	8	1	1	14

Alive and Free from Disease.	Alive and Well with Palpable Tumour.	Alive with Active Disease.	Dead from Malignant Disease.	Dead from Other Causes.	Died During or Just After Radiation.
25	3	3	14	1	8

One Course of Radiation.	Two or More Courses of Radiation.	One Millimetre of Copper Filtration.	Two or Three Millimetres of Copper Filtration.
28	18	13	33

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REVIEW OF A SERIES OF THIRTY CASES OF MALIGNANT DISEASE OF THE OVARY.[1]

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SINCE 1923 thirty patients with malignant disease of the ovary have been treated. Seven are alive and well, twenty are dead, and three cannot be traced.

The pathological classification of the growths was as follows:

(a) Solid ovarian carcinoma .. 2 cases
(b) Papillary cyst-adenoma .. 11 cases
(c) Adenocarcinoma .. .. 8 cases
(d) Sarcoma of ovary .. .. 1 case
(e) Unclassified .. .. .. 8 cases

[1] Read at the Fifth Australian Cancer Conference, Canberra, April, 1934.

All the tumours in Group (*e*) were clinically malignant, but no pathological report is available showing the exact nature of the tumour.

Clinical History.

The majority of the patients were not seen until the condition was advanced, presenting large tumour masses and much free fluid. Nearly all patients were subjected to paracentesis or exploratory laparotomy. Some of those who were subjected to laparotomy died within a few days or weeks of exploration. It is felt, however, that every patient should be subjected to an exploratory laparotomy even if the growth is fixed and seems inoperable. There is no doubt that in a proportion of cases the natural defences of the body seem to have the power to deal with a certain amount of residual malignant tissue if the main mass of the growth is removed. This is illustrated by three cases in this series. Two of these three patients are alive and well eight years after such an operation, while one, who was reduced to less than 31·5 kilograms (five stone) in weight, recovered, gained 18·9 kilograms (three stone) and remained in excellent health for three years before a fatal recurrence occurred.

If the malignant cyst can be removed unruptured and there is no obvious peritoneal invasion, the subsequent outlook is very good. This is shown in three patients in this series who are alive and well for periods varying from six months to three years after operation without any sign of recurrence.

Solid Ovarian Carcinoma.

Both patients with solid ovarian carcinoma manifested early and severe recurrence of the growth, even although there was no obvious secondary infection of the peritoneal cavity at the time of operation. One survived twelve months, but her abdomen was tapped several times during that time, while the other survived operation only six days. In the latter case the condition was complicated by a pyosalpinx.

X Rays.

All the patients seen since 1928 have been recommended to have deep X ray therapy after operation, but I cannot say that any patient who has been subjected to deep X ray therapy has been permanently cured. There is no doubt that in some cases there is a temporary cessation of growth and even a diminution in the size of the tumour. In my experience this, however, is only temporary, and in five cases I have seen no improvement at all following X ray treatment by competent radiologists.

Summary.

I am of opinion that every ovarian cyst should be removed when diagnosed. If the patient is unwilling to submit to operation, the cyst should be kept under close observation at regular intervals. Any rapid increase in size is very strongly suggestive of malignant changes and calls for immediate removal. All unruptured cysts, no matter of what size, should be removed unruptured if it is surgically possible. This sometimes requires a very large incision. It is unjustifiable to tap and drain any ovarian cyst, as there are cases in which it is impossible to tell from naked eye inspection whether malignant changes have commenced inside the cyst. Any infection of the peritoneum by fluid containing malignant cells may lead to early extensive recurrence.

Even if it is considered that an ovarian cyst is malignant and has ruptured with secondary invasion of the peritoneum, laparotomy should be performed with removal of as much as possible of the malignant tissue.

In all cases both ovaries, and if practicable the uterus, should be removed.

Every patient should be given a full course of deep X ray therapy after operation, as there is no doubt that X rays in some cases tend to check the growth.

Analysis of Deaths.

I have appended short notes of seventeen of the cases in which death occurred.

1. Double solid ovarian carcinoma. The tumours were removed. The patient lived twelve months and died of recurrence.

2. Advanced tumour with free fluid. The abdomen was tapped three times. The patient was given deep X ray therapy and died in four months.

3. Very advanced ruptured malignant cyst. Section with removal of malignant tissue was performed. The patient recovered, but died three years later of recurrence.

4. Removal of ruptured cyst. The patient died two years later. A secondary malignant mass was present around the kidney.

5. Advanced malignant tumours removed. The patient died four days later from syncope.

6. Advanced ruptured malignant cyst. The patient lived five months after exploratory laparotomy.

7. Advanced ruptured malignant cyst. Much free fluid was present with multiple malignant nodules. Laparotomy was performed and deep X ray therapy was given. The patient lived fourteen months.

8. Advanced infection of abdominal cavity with secondary growths in omentum. Exploratory laparotomy was performed. The patient died two months later.

9. Advanced ruptured cyst with secondary growths. Laparotomy was performed and deep X ray therapy was given. The patient lived eighteen months.

10. Advanced ruptured cysts with secondary growth and involving most of the peritoneal cavity. Laparotomy was performed. The patient died two months later.

11. Advanced inoperable ruptured growth with malignant secondary growth. Laparotomy was performed and deep X ray therapy was given. The patient lived six months.

12. Advanced inoperable ruptured cyst. Laparotomy was performed and deep X ray therapy was given. The patient lived four months.

13. Solid ovarian carcinoma with pus tube. Laparotomy was performed. The patient died six days later from peritonitis.

14. Advanced ruptured cyst with secondary growth. The patient refused treatment. She died five months later.

15. Advanced ruptured cyst. The condition was considered inoperable. The patient died four weeks later.

16. Advanced malignant ruptured cyst with secondary invasion of peritoneum. Laparotomy was performed. The patient died four days later.

17. Advanced malignant ruptured cyst with secondary deposits through the abdomen. Laparotomy was performed and deep X ray therapy was given. The patient died four months later.

The remaining three patients have not been traced, but are presumed to be dead, as when last seen they were in an advanced and inoperable condition.

Reports of Cases.

STRANGULATED HERNIA.

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THE notes on the following case may be of interest owing to the various lesions encountered during an operation for what appeared at first to be a straightforward case of strangulated inguinal hernia.

C.O., aged fifty-four years, was admitted to the Royal South Sydney Hospital on March 20, 1933, with a history of a "lump in the groin" of several years' duration. This had been reducible until two days before, when the "lump" had persisted and become painful, accompanied by nausea and vomiting.

On examination a large, tense, ovoid mass was seen in the region of and above the right external abdominal ring. Strangulated inguinal hernia was diagnosed. Taxis was not attempted, as the skin had a subjacent bluish tinge.

A long incision was made and a tense sac was exposed. A constriction at the neck of the sac was divided and the sac opened. It was a sliding hernia and contained the caecum. The appendix was gangrenous from tip to base and was amputated. Prior to the removal of the appendix a yellowish thread-like foreign body was noticed on the wall of the caecum, about 3·75 centimetres (one and a half inches) lateral to the base of the appendix. This was picked up with forceps and gently drawn from the caecal wall, into which one end was embedded, and delivered. It was a fish bone, with one end pointed (the free end) and the other rounded, thus anchoring the bone to the caecum.

The minute opening was buried with a purse-string suture and two or three Lembert sutures. A repair was then performed and the wound closed.

Thus in the one case were present: (i) a sliding strangulated inguinal hernia containing the caecum, (ii) a gangrenous appendix, (iii) a foreign body (fish bone) perforating the caecal wall. The patient, to his recollection, had not had any fish in his diet for at least eighteen months. He made an uneventful recovery, and at this date (April, 1934) had had no recurrence of the hernia.

Reviews.

RHEUMATIC DISORDERS.

"THE TREATMENT OF RHEUMATISM IN GENERAL PRACTICE" by W. S. C. Copeman, a small and readable book of 215 pages, is a welcome addition to the literature on this difficult subject.[1] It is a book written for the general practitioner, and is sure to become popular. Dr. Copeman is a physician on the staff of the British Red Cross Society Clinic for rheumatism which was established in London in 1929, following a report by the Ministry of Health calling attention to the vast amount of invalidity caused by diseases classed as rheumatic. The clinic has been highly successful; this book gives an account of the methods used.

The arrangement of the book will appeal to the busy practitioner. The earlier chapters are devoted to a short account of the clinical features of the various rheumatic affections together with the treatment recommended. In later chapters the general aims of treatment and detailed information concerning the various measures available are dealt with.

In Part I rheumatic fever and chorea are discussed. It is interesting to note that rheumatic fever is now looked upon as a chronic disease with acute exacerbations rather than an acute disease. Arsenic is still the favourite drug in the treatment of chorea, "Nirvanol" is dismissed with scant praise. In Part II the author deals with muscular rheumatism and fibrositis, sciatica and neuritis, rheumatoid arthritis, osteoarthritis and spondylitis. In Part III he discusses such measures as medicinal treatment, diet, vaccines, physical methods, colonic therapy *et cetera*. The tendency to treat rheumatic affections, especially the more chronic ones, by the use of analgesic drugs to the exclusion of other methods is deplored; the relief of pain is important, but should not be the only aim. The chapter on medicinal treatment is a good one and will help to clear the mind of the practitioner, harassed by the ever increasing array of specifics for rheumatism, chiefly analgesic drugs that are being thrust under his notice. The value of physical methods is stressed; many of those described can be used at home without elaborate apparatus. The chapter on manipulation merits attention; hitherto a field exploited almost solely by the osteopath, it will well repay the medical practitioner who familiarizes himself with it, for in many cases it will result in benefit to his patient. This is a practical book written by a man with a logical mind and a sense of humour; the medical practitioner will find in it much valuable information.

THE UNIVERSITY OF EDINBURGH

THE Tercentenary of Edinburgh University was marked by the publication in 1884 of "The Story of the University during its first Three Hundred Years", by Principal Sir Alexander Grant. In the fifty years since then, the growth of what is in some respects the most celebrated British university has been such that the three hundred and fiftieth anniversary of the foundation of the "Town's College" was thought to present a fitting opportunity for the publication of the "History of the University of Edinburgh, 1883-1933".[1] The volume, which is compiled from the work and writings of more than twenty-five contributors, is edited by Dr. A. Logan Turner. Though intended as a sequel to Sir Alexander Grant's history, the majority of the contributors have found it expedient in the interests of continuity to dovetail their narratives back into the period covered by the parent work, while Professor Hannay, who contributes the first chapter—"The Foundation of the College of Edinburgh"—has been able, as a result of recent researches, to rewrite this portion of history and modify some of the conclusions regarding events which occurred at a time of religious revolution and political turmoil. The history of the administration is described by Professor William Wilson. The succeeding chapters are devoted to the histories of the various faculties in turn. The Faculty of Science was not established until 1893. It comprised the departments which had till then been administered by a committee of the Arts Faculty. The Faculty of Music was instituted in the same year by a special ordinance. The remainder of the book deals with the library, the University portraits and the life of the student community.

[1] "The Treatment of Rheumatism in General Practice", by W. S. C. Copeman, M.A., M.B., B.Ch., M.R.C.P., with foreword by Sir William Hale-White, K.B.E., M.D., F.R.C.P., Hon. LL.D.; 1933. London: Edward Arnold. Demy 8vo., pp. 223. Price: 9s. net.

[1] "History of the University of Edinburgh, 1883-1933", edited on behalf of the History Committee by A. L. Turner, M.D., LL.D., F.R.C.S.; 1933. Edinburgh: Oliver and Boyd. Royal 8vo., pp. 483. Price: 10s. net.

Evidence of the growth of the university in the last fifty years is the increase of the teaching staff. In 1884 there were 39 professors, 3 lecturers and 26 assistants, for 3,374 students. Today for 4,327 students there are 59 professors, 9 readers, 148 lecturers and 99 assistants, without counting the clinical teaching staff. The ordinary annual budget has grown from about £70,000 to more than £286,000. In the first three years of the half century were founded the Students' Representative Council, the first body of its kind in the country, though quickly copied by the other Scottish universities, the University Union and *The Student*—the Edinburgh University magazine. The Students' Representative Council was given formal recognition by the *Universities (Scotland) Act* 1889. In 1888 *The Student* was adopted as the official journal of the Representative Council and assumed a more pontifical tone. In 1889 it severely criticized the "unfortunate style" of a "young writer" named J. M. Barrie who had committed the error of contributing to the *British Weekly* with which *The Student* had then a bitter feud. By the Act of 1889 women were to be admitted to the regular classes of instruction and to graduation on terms of equality with the men. In the same year the medical course was increased from four to five years and the degrees designated by the letters M.B., Ch.B. instead of M.B., C.M. In 1901, Andrew Carnegie donated ten million dollars to create the Carnegie Trust. The Trust provided that one half of the net annual income should be devoted to the improvement and expansion of the four Scottish universities in the Faculties of Science and Medicine, and certain subjects in the other faculties. The other half of the revenue was to be devoted to the payment, under certain conditions, of the ordinary class fees of necessitous students. At the present day, the Trustees, after spending £3,500,000 of the income, find themselves in possession of a capital that is £1,500,000 larger than the original sum donated. In the interests of the physical welfare of the students, authority was obtained in 1930 to increase the annual matriculation fee by half a guinea. By means of the money thus raised, a gymnasium is made available for the free use of the students. All students are now entitled to free medical examination, and are given advice regarding suitable exercises. With the aid of grants made by the Carnegie Trustees and the University Grants Committee, the women students were provided in 1931 with athletic grounds of their own.

As far as its matriculations show, Edinburgh is still the most cosmopolitan of British universities. There are now over 19,000 graduates scattered throughout the world—over 16,000 in Europe, 1034 in Asia, 1003 in Africa, 573 in Australasia and 590 in the Americas. Dominant in the genesis of many of the younger, and with her graduates teaching in most of the universities of the Empire, the influence of the university of Edinburgh can hardly be overestimated.

Though of special interest to former students and to visitors to Edinburgh, the volume is a contribution to history, and valuable as a work of reference. It is worthily produced and very moderate in price.

MEN OF MEDICINE AND LETTERS.

For those who like to wander down the interesting byway which connects medical literature and the general world of letters, nothing better, for hours of leisure, can be recommended than Professor Monro's slender book, "The Physician as a Man of Letters, Science and Action".[1] It may be said that the volume deals, by means of a series of thumbnail sketches, with those medical men who have distinguished themselves by their extra-medical activities. An example or two will serve to indicate the design of the book. Robert Bridges, having worked as Assistant Physician at Great Ormond Street and as Physician to the Great Northern Hospital, retired from practice in the year 1882 and devoted himself to the composition of poetry. In 1913, Bridges was appointed Poet Laureate, and died, austere and solitary, in his Oxford home in 1930. Thomas Neill Cream, Hawley Crippen, George Henry Lamson, Edward William Pritchard and Thomas Smethurst were each of them doctors whose renown rests, not upon their professional attainments, but upon the fact that they were hanged for murder. Amongst the canonized saints, forty are said to have been physicians, and Popes John XXII, Paul II and Nicholas V were professionally equipped to cure bodies as well as souls. Dr. Thomas Dover (he invented "Dover's Powder") was a privateer and freebooter. He sailed with Dampier, and in the year 1709 he discovered Alexander Selkirk ("Robinson Crusoe") on Juan Fernandez. There is scarcely any field of human endeavour in which the medical profession has not distinguished itself. Poetry, drama, philosophy, exploration, science, literature and the law—each of these is under a deep debt to men whose primary task was the treatment of disease and the alleviation of suffering. If any adverse comment may be levelled at Professor Monro's excellent book, it is that it seems to have been designed as a mere book of reference. It has been constructed in the "Who's Who" manner. The characters are arranged in alphabetical order, and the index is Scottishly complete. With the wealth of material at his command Professor Monro would surely have been better advised to have written his book in narrative style. Still, as it stands, the work is a fascinating and valuable contribution to letters and to medicine.

[1] "The Physician as a Man of Letters, Science and Action", by T. K. Monro, M.A., M.D.; 1933. Glasgow: Jackson, Wylie and Company. Demy 8vo., pp. 220. Price: 10s. 6d. net.

RADIOLOGY OF THE NASAL SINUSES.

"THE NASAL ACCESSORY SINUSES", by Frederick M. Law, M.D., is Volume XV in the series of monographic atlases of the *Annals of Roentgenology*.[1]

This is the second monograph in the series written by Dr. Law; the first article dealt with mastoids. The present book has two main divisions, text and illustrations. The text is further subdivided into chapters on: (i) anatomy; (ii) technique: general considerations; (iii) Röntgenographic technique; (iv) interpretation; (v) diagnosis.

In the general considerations of technique the author rightly emphasizes the importance of standard positions of the patient and tube. Although he frequently calls the "nose-chin" "Water's position", he makes it quite plain that the correct position depends not on the name by which it is called, but upon the angle of both tube and patient's head in relation to the film and to each other.

Another point which does not appear to be sufficiently stressed, although evidently appreciated by the author, is that simplicity of apparatus enables the patient to be placed rapidly in position and the film to be exposed before the patient becomes tired, thus avoiding one source of movement which spoils so many films.

The prone position is still retained as a routine. We consider this position not an advantage, as respiratory movements are more objectionable radiographically when the patient is prone than when upright. The fluid level in sinuses, which has been incorrectly interpreted by some authors, is here correctly described and interpreted, although it cannot be properly visualized in the prone position. The injection of opaque media into the sinuses is recognized as obscuring many conditions rather than in assisting in their elucidation.

In Röntgenographic technique the author emphasizes the importance of correct tube voltage and time of development in producing a skiagram with sufficiently soft shading to show mucosal changes.

In the chapter on diagnosis team work between rhinologist and radiologist is shown to be very necessary. One of the commonest pitfalls for the radiologist is not

[1] "Annals of Roentgenology: A Series of Monographic Atlases, edited by J. T. Case; Volume XV: Nasal Accessory Sinuses", by F. M. Law, M.D.; 1933. New York: Paul B. Hoeber. Demy 4to., pp. 239. Price: $10.00 net.

mentioned, namely, that an antrum which has been through a radical operation always appears thereafter as a pathological antrum. The two chapters on diagnosis and interpretation could easily have been reduced to a single chapter.

The second part of the book consists mostly of illustrations and some explanatory texts. The illustrations are very good, but, like most reproductions of skiagrams of the nasal accessory sinuses, the old difficulty has been only partly overcome and, as the author explains, much of the softer detail upon which the interpretation of the skiagram depends is lost. It has been pointed out by an Australian author that for illustration purposes positives give more detail than negatives, and we think it would have served Mr. Law's purpose better had he followed this practice, for a great many of his illustrations fail to convey the points that he wishes to emphasize. In Australia more use is made of the "nose-chin" position, that is, the position in which the shadow of the petrous temporal bone is thrown below the antrum, and we feel that more than passing notice should have been made of this position, for as far as X ray appearance of maxillary sinus disease is concerned, it is the all-important one.

Both radiologists and rhinologists should peruse this volume, especially the chapter on diagnosis.

The monograph is "dedicated to Dr. Cornelius G. Coakley, who, with the late Dr. Eugene Caldwell, was the real pioneer in the Roentgen examination of the nasal accessory sinuses in America". There is no acknowledgement in this volume of the sound pioneer work done by the Viennese and German schools of rhinology probably earlier than the above-mentioned fathers of American rhinology.

The correlation of pathological reports with X ray and clinical findings is rather incomplete.

Although it is three years since an exhaustive article on the use of X rays in maxillary sinus diseases appeared in an Australian journal and a more elaborate one in *The Journal of Laryngology and Otology* one year later, no mention has been made of this valuable contribution to the subject.

PHYSIOLOGY.

A TEXT BOOK that has gone through thirty-three editions obviously fulfils the purpose for which it was written. As a text book in physiology for junior students of medicine, "Halliburton" has for many generations of students been first favorite in British schools of medicine. Since the death of Professor Halliburton it has been under the charge of his successor at King's College, Professor McDowall. In this new edition, Professor McDowall has ably maintained the traditions of his illustrious predecessor.[1] The publishers on the cover state:

> This new edition marks the transition in the general character of the book which the advance in knowledge has made possible. All the early text books of physiology were written on an anatomical basis, but the time has come when the body must be considered more from the point of view of physiological processes than from that of functions of isolated organs.

Within the limits set by the aim that the book shall be fundamentally one for medical students, Professor McDowall has succeeded in presenting the essentials of physiology in a succint and readable form. The phraseology is not always as good as it might be and in some particulars the author does not present the best modern views. For example, the chemistry of the blood pigments is distinctly out of date, as also is the chapter on immunity. On the whole, however, the material presented is thoroughly modern. The book can be confidently recommended to medical students and others reading elementary physiology, and also to medical practitioners wishing to brush up their physiology, although there are better books available for this purpose.

[1] "Handbook of Physiology", by the late W. D. Halliburton, M.D., LL.D., F.R.C.P., F.R.S. and R. J. S. McDowall, M.B., D.Sc., F.R.C.P.; Twenty-Third Edition; 1933. London: John Murray. Medium 8vo., pp. 982, with numerous illustrations in the text, many of which are coloured, and four coloured plates. Price: 18s. net.

AMENTIA.

BASED as it is on Freudian psychology, the book on "Amentia" by L. Clark aims at a psychoanalytical interpretation of the nature of mental arrest and at the possibility of treatment along psychoanalytical lines.[1] After an introduction to the Freudian theory, the author deals with the "Problem of Mental Arrest", with strong emphasis on the psychic rather than the organic nature of mental deficiency. The following chapters are devoted to the description of individual cases, ranging from idiocy to borderline cases of feeblemindedness. They are so full of the "probable" causes, the "possible" explanations, the "tentative" understandings and the "speculative" theories with a view to "suggestions" for "enlightened therapy", that it can at least be said that the treatment of the ament by the depth psychologist is but in its infancy and up to the present has not been justified by its tangible results.

The concluding chapters deal with the ament in the social sphere. The supposition of "ego", "super-ego" and "ego-ideal", their "cooperation" and "co-ordination" and their task in "guiding and controlling the instinctual energies" is typical of the psychoanalytical conception. But the supposition of a weak "ego" or "super-ego" as a causative factor of anti-social behaviour, leaves us as far as ever from an understanding of delinquency in the ament.

The highly technical phraseology in which the book is written, creates the necessity for a glossary of several pages.

This is a book not for the general practitioner, but one which will be revelled in by the ultra-Freudians.

[1] "The Nature and Treatment of Amentia: Psychoanalysis and Mental Arrest in Relation to the Science of Intelligence", by L. P. Clark, assisted by the staff of the Psychoanalytic Sanatorium at Rye, N.Y., with foreword by E. Jones, M.D.; 1933. London: Baillière, Tindall and Cox. Royal 8vo., pp. 322. Price: 12s. 6d. net.

CORRIGENDUM.

A MISTAKE has occurred in the footnote to the review of "Starling's Principles of Human Physiology", which appeared in the issue of April 28, 1934, at page 566. In the review itself the edition was correctly stated to be the sixth edition, published in 1933; the footnote used was that of the fifth edition of 1930. The publishers are Messrs. J. and A. Churchill, London.

Notes on Books, Current Journals and New Appliances.

ANOTHER STORY OF THE WAR.

OF the making of books on the Great War there is no end. The latest comes from Sister May Tilton and is called "The Grey Battalion".[2] It is the story of the author's experiences in Egypt, on a hospital ship, in England, in France and in Belgium. The story is quite well told. A foreword is written by Field Marshal Sir W. R. Birdwood, and there is another by Matron Conyers, Matron-in-Chief of the Australian Nursing Service during the greater part of the war.

[2] "The Grey Battalion", by May Tilton; 1933. Australia: Angus and Robertson, Limited. Crown 8vo., pp. 310, with photographs. Price: 6s. net.

The Medical Journal of Australia

SATURDAY, MAY 19, 1934.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

INFECTIOUS DISEASES AND INFECTIOUS DISEASES HOSPITALS.

THE governing bodies of hospitals set apart for the treatment of patients suffering from infectious diseases are faced with administrative problems similar to those arising in connexion with any hospital. These problems, however, are complicated by others that have their origin in the infectivity of patients and their contacts. Most of the problems of the second group have an important bearing on, and to a large extent overshadow, those of the first. For example, the planning of an infectious diseases hospital, its equipment and its staff cannot be considered apart from infectivity of the patients treated within its walls. A moment's thought will show that the problems of an infectious diseases hospital need at least to be understood by the general practitioner. He may not be called upon to take an active part in their solution, but on his understanding and on his willingness to cooperate in the handling of patients, the successful running of an infectious diseases hospital will largely depend. Even if no special hospital is available to him, he will find scope for putting into practice the principles that would govern his actions were he more fortunately placed.

This subject is of importance at the present time owing to the appearance of a report made to the Chairman and Members of the Board of the Infectious Diseases Hospital, Fairfield, by Dr. F. V. Scholes, the medical superintendent of the hospital. Dr. Scholes is a recognized authority on infectious diseases, his text book is regarded as a standard work, and his opinions in the present instance will carry weight. Dr. Scholes bases his report on inquiries and observations made in Great Britain and Europe during the months April to October, 1933. He first of all shows how the passage of the *Local Government Act*, 1929, Parts I, IV and V, produced a change in public hospital provision and administration in Great Britain. He then refers to the work of the Hospital Standards Committee and of other committees that were appointed to investigate hospital matters in London. In view of the leading article recently published in this journal on the work of the Standards Association of Australia, there is no need to refer to the work of the Hospital Standards Committee in Great Britain. We would, however, point out that the need for standardization is emphasized by Dr. Scholes, who remarks that during his twenty-five years of experience at Fairfield he has often been struck with the unsatisfactory procedure of calling for, examining, and accepting tenders or competitive quotations without adequate standard samples for comparison, definite specifications and other safeguards. He adds: "There is a whole host of regular requirements that can be accurately standardized, for supply and use in our own hospital." In discussing pathological laboratory services, Dr. Scholes points out that it is not in the best interests of either patients or medical attendants that pathological work should be done at other hospitals or sent to commercial firms. He insists, as we have often insisted in these pages, that cooperation and consultation between clinician and pathologist are

absolutely necessary. If, as so often happens even in the cities of the Commonwealth, pathological investigations for clinicians in hospitals are to be done at government or privately owned laboratories, the laboratory workers should be given access to the bedside of the patient and should not be treated as specimen-in-the-slot machines. Further, everyone will agree with the principle involved in Dr. Scholes's recommendation that at Fairfield research should be concentrated on one or two main subjects, that inquiry should be thorough and that all the clinical material available should be used.

On the clinical side Dr. Scholes discusses many important subjects. Under the heading of diphtheria he expresses the opinion that the admission to hospitals for acute diseases of healthy contacts who have positive swabs, of healthy carriers discovered by a process of wholesale or indiscriminate swabbing, and even of presumably infecting carriers, should be discouraged. While he points out that so-called mild scarlet fever is a treacherous disease and that serious troubles often arise in the third and fourth weeks, especially in young children, he believes that the home treatment of scarlet fever, when home conditions are favourable, should be encouraged. His remarks on measles are important. In his experience, the complication rate of measles cases treated from an early stage in hospital is less than of those treated under fairly good home conditions, and infinitesimal compared with that in patients nursed in poor homes. He thinks that in regard to admission to hospital, measles patients from poor homes should be given preference over both diphtheria and scarlet fever patients who are suitable for home treatment. This is one of the points raised in Dr. Scholes's report to which general practitioners should pay particular attention. There are many others which cannot be discussed on this occasion; they include the criteria for the discharge of patients from hospital, return cases, control of infection in schools, immunization, and so on.

Some idea of the scope of Dr. Scholes's report has been given in this short statement. The object in making the statement has been twofold: in the first place, to awaken interest in the subject; in the second, to induce medical practitioners to secure a copy of the report and to study it.

Current Comment.

DISORDERS OF THE ŒSOPHAGUS.

IT is curious that even clinicians of an extended experience, when confronted with a patient who complains of trouble with the act of swallowing, tend to think with unusual readiness of the possibility of a functional disorder. Perhaps the inaccessibility of the œsophagus to ordinary clinical examination robs us of those visual pictures that are so great a help to memory. Hysterical dysphagia must be a rather uncommon ailment, and here, as in all other cases of subjective complaints, it is essential that all organic causes should be excluded. A. F. Hurst has summarized his views upon a subject in which he is known to be very interested, that of œsophageal disorders, in an address given before the New York Academy of Medicine.[1] He remarks that the anæmic variety of dysphagia, sometimes known as the Plummer-Vinson syndrome, was considered by these writers to be hysterical, but points out that it is without doubt related to a true inflammatory lesion, for there is a constant concomitant glossitis. Similarly, other organic causes of dysphagia have been considered functional until their true basis was demonstrated. That there is frequently a functional side to the clinical picture none would deny, but this is the everyday experience of every practitioner of medicine. Hurst's views on cardiospasm, or, as he calls it, achalasia of the cardiac sphincter, are well known. In this address he recapitulates the evidence in favour of an inflammatory lesion of Auerbach's plexus at the lower end of the œsophagus, and some clear microphotographs are reproduced supporting this thesis.

Hurst does not specially refer to carcinoma, but the practitioner must never lose sight of this possibility, for if this lethal and distressing form of neoplasm is to be brought within the surgeon's scope it must be observed early. He describes two other varieties of œsophageal lesion that are uncommon but nevertheless worthy perhaps of a wider recognition. These are peptic ulcer of the œsophagus and a syndrome due to recurrent diaphragmatic hernia. The former is very rare, judged by clinical and autopsy records, but Hurst quotes the experience of Jackson, who believes it occurs more frequently than is usually thought. The symptom is pain or discomfort under the lower part of the sternum, felt while solid food is eaten or shortly after food. This often radiates to the back, and at first is

[1] *The Journal of the American Medical Association*, February 24, 1934.

brief in duration and relieved by alkalis; later, however, it is more severe and prolonged and the patient is afraid to eat. This condition has been confused with a neurosis. Hæmatemesis may occur, and other complications are perforation and stricture. Diagnosis is difficult, but is made easier by radiographic study and endoscopy. The small hiatus hernia referred to is another cause of obscure symptoms. The œsophageal hiatus is unusually lax, allowing a small segment of the cardiac end of the stomach to be pushed into the thorax under conditions of pressure. The hernia is usually intermittent, but occasionally becomes permanent. The symptoms are referred to the upper part of the abdomen, may be severe with pain or vomiting, and may simulate a cardiac angina by its distribution. A distinctive feature is that the attacks are nocturnal or are induced by certain postures, such as stooping; sitting up usually gives relief. A radiographic diagnosis may be made more readily if the barium meal is swallowed while the patient is lying down, and films are taken in that position.

These disorders are of interest, and though it may fall to the lot of none but the specialist to make a confident diagnosis of a rarity, it is always well to remember that, even though ordinary routine methods of investigation in obscure cases may prove barren, there may still be a demonstrable organic cause for the patient's symptoms.

HOUSING CONDITIONS AND ACUTE RESPIRATORY DISEASE.

THERE is no doubt about the seriousness of acute respiratory disease. Osler justly transferred Bunyan's epithet, "Captain of the Men of Death", to pneumonia, and the gravity of this infection is a byword; but the importance of this as well as of the lesser forms of infective disease in the respiratory tract has often been overlooked. This has been emphasized lately by the revived interest in such subjects as the treatment of acute lobar pneumonia, the prevalence of sinus disease, and the indications for tonsillectomy. Wishing to ascertain what bearing housing conditions have on the incidence of these infections, the Medical Research Council has published the results of an investigation carried out in Glasgow by C. M. Smith, of the Public Health Department of that city.[1] Local conditions favoured such an inquiry. Over a ten-year period the death rate from pneumonia in Glasgow was 18%; even in the most favourable age periods, five to twenty-four years, it reached 12%. The contrasted housing conditions comprised on the one hand a crowded tenement area, where the houses were old, badly designed, decayed, and ripe for municipal condemnation, on the other a series of modern working class tenements removed from the congested city areas, well designed, new, and of adequate room capacity. It is almost certain that anyone would confidently expect the respiratory morbidity to be lowered in the latter area. However, one is surprised to find that the morbidity rate was actually slightly higher in the better area. Several causes operate in introducing fallacies into this statistical survey. Thus overcrowding, theoretically avoided in the better dwellings, still obtains, especially during the winter months, for the tenants bring their bad habits with them. Climatic conditions must be remembered, of course; poor people must keep themselves warm in the cheapest way. Also there was a larger foreign element in the slum areas, rather more constantly in employment, and rather better fed than the native population. The accuracy of reporting ailments to the visiting inspector on his weekly visits was thought to be higher in the rehoused population. These considerations indicate the great difficulties that lie in the way of reliable field work in the course of social and hygienic studies; they emphasize, too, the notorious unreliability of figures *per se*. But the real value of this study lies in this very difficulty, as also in its insistence upon the frequency of both minor and major respiratory infections. The causes of the prevalence of these ailments among poor people have been variously stated: besides poor housing conditions, with their concomitant lack of light and ventilation, questions of nutrition must not be overlooked. As Mellanby has pointed out, excess of carbohydrate and deficiency of vitamins may be in part responsible.

The types of infection met with are familiar everywhere. In order of frequency the commonest were coryza, bronchial catarrh, that vague "influenzal" attack called "chill" by the writer of the report, sore throat, pneumonia, laryngitis and pleurisy. It is evident that we still lack a name for the so-called "chill". It may well be called influenza during an epidemic, and perhaps this name serves as well as any other; "chill" appears to be a very undesirable name to teach the public, for it suggests a false ætiology that in itself may lead to exclusion of fresh air and to the encouraging of the overcrowding in rooms that must be at least one causal factor. However, whatever we call them, this group of diseases caused almost as much morbidity among the subjects of this inquiry as did all other incident diseases. There was no evidence that chronic respiratory catarrhs were contributory causes to attacks of pneumonia; this subject has been discussed recently in these pages, and the epidemiology of pneumonia seems to be one of the incomplete chapters of medicine. Attention has also been drawn to an American observation on the importance of infectious respiratory catarrhs in intestinal infections. For the present, then, there is little fresh to add to our knowledge of these common affections; their treatment and their prevention (if, indeed, this be at all possible) is still the province of that hard-worked man, the general practitioner.

[1] C. M. Smith: "Housing Conditions and Respiratory Disease: Morbidity in a Poor-House Quarter and in a Rehousing Area in Glasgow", Medical Research Council of the Privy Council, Special Report Series, Number 192; 1934. London: His Majesty's Stationery Office. Pp. 36. Price: 9d. net.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

The Concentration of Hæmagglutinating Sera.

R. A. Q. O'Meara (*The Journal of Pathology and Bacteriology*, July, 1933) advocates the method applied by Aland for the concentration of complement to the concentration of agglutinating sera. The serum is frozen solid and is then allowed to thaw undisturbed at room temperature. On thawing, the agglutins are found to be concentrated in the lower layers of the serum, which are much darker than the original. The top layer, which is like water in appearance, possesses little or no agglutinating power. The withdrawal of the upper two-thirds suffices to leave a residue with greatly concentrated agglutinating powers.

Tetanus Toxoid in Prophylaxis against Tetanus.

Daniel H. Bergey and Samuel Eyre (*Journal of Infectious Diseases*, November-December, 1933) record the results of experiments on the immunizing value of tetanus toxoid in guinea-pigs. The toxoid was prepared by treating a toxin containing four thousand minimum lethal doses per cubic centimetre with 0·4% formaldehyde. The authors suggest that tetanus toxoid may be advantageously employed to induce active immunity in workers in certain industries who frequently meet with injury. If the injured person receives simultaneously a dose of antitoxin and a dose of toxoid, and if the dose of toxoid be repeated after fifteen and after thirty days, this is all that is required. The special advantage in the use of the toxoid is that no serum is injected. A still greater use of toxoid is in the active immunization in armies. This could be carried out at the same time as typhoid-paratyphoid immunization. In the immunization of horses for the production of tetanus antitoxin, toxoid would also prove useful. It was found that three doses of one cubic centimetre each of toxoid produced a high degree of protection in guinea-pigs.

Mumps.

Claude D. Johnson and Ernest W. Goodpasture (*Journal of Experimental Medicine*, January, 1934) have investigated the ætiology of mumps by the introduction of fresh untreated saliva from patients with mumps into the parotid glands through Stenson's duct. The rhesus monkey was the animal used. Fresh saliva from six patients with mumps was used. Four of these specimens produced specific parotitis with leucopenia and relative lymphocytosis, and two produced no recognizable disease in the inoculated animals. Of the two specimens that failed to produce disease, one was obtained on the third day of the disease and the other not earlier than the third day. The result indicated that saliva collected within the first twenty-four hours after the onset of mumps is more likely to be infective for monkeys than that recovered at a later date. About two cubic centimetres of saliva were injected directly into Stenson's duct, and the temperature was taken and total and differential leucocyte counts were made before and after inoculation. Saliva collected from two normal persons was inoculated into two monkeys. The parotid glands increased in size for twelve to twenty-four hours and then returned to normal. No enlargement or tenderness was noted once the glands returned to normal, and no rise in temperature or leucopenia occurred. The glands of the monkeys killed at the height of the disease were used for the preparation of emulsions for the passage of the virus from monkey to monkey. In every one of five experiments the filtrate proved to be virulent. The incubation period proved to be from one to four days longer than for the unfiltered material. Two of the monkeys were allowed to recover from the effects of their inoculations, and two months after recovery were reinoculated. Neither of them showed any symptoms following the reinoculation, while a control inoculated at the same time with the same emulsion developed clinical and histological evidence of infection. The infecting agent obtained has the characteristics of a filtrable cytotrophic virus with a predilection for parenchymal cells of the parotid gland. It is resistant to drying and to glycerination, and it causes a lesion which is primarily a degeneration and necrosis of the parenchyma cells of the parotid. It confers immunity to reinoculation. A similar virus has not been found in saliva other than that of patients suffering from mumps.

Hæmolytic Streptococci from the Vaginæ of Parturient Women.

Ronald Hare (*The Journal of Pathology and Bacteriology*, March, 1934) has investigated strains of hæmolytic streptococci from the vaginæ of both febrile and afebrile parturient women. Organisms recovered from both groups of cases produce β hæmolysis on blood agar, secrete soluble hæmolysin, and the majority ferment lactose and salicin, but not mannite. The absence of fever in one group is usually ascribed to an immunity towards the organism, but the author considered that some other factor which controlled the multiplication of the invading organisms when they gained access to the blood stream might be worth investigating. He therefore studied the bactericidal action of the blood from normal adults and from febrile and afebrile patients upon streptococci recovered from both groups of patients. He found that hæmolytic streptococci from cases in which there has been much invasion of the tissues are able to multiply in normal blood, whereas strains from cases in which no evidence of an active infection was discovered are killed very readily. Strains from cases in which invasion of the tissues and septicæmia have occurred are able to resist phagocytosis, and it is probably because of this that invasion occurs, since, if the leucocytes are removed from the blood, even avirulent organisms will multiply in it. The author suggests that examination of the ability to multiply in human blood might be made use of to assess the importance of strains of hæmolytic streptococci isolated from the throat and nose of persons suspected of infecting women at the time of childbirth.

The Normal Flora of the Prepuberal Vagina.

Horace Pettit and Charles H. Hitchcock (*Journal of Infectious Diseases*, November-December, 1933) have studied the prepuberal flora in the vaginæ of sixty children, most of whom had orthopædic conditions. The flora proved to be mainly diphtheroids. Gram-positive cocci, such as non-hæmolytic streptococci and *Staphylococcus albus*, were recovered less frequently and in fewer numbers. Organisms of the intestinal group were found to occur very seldom in healthy children, but in severely ill patients these organisms, together with *Staphylococcus aureus*, frequently overgrew the normal inhabitants.

Experimental Pertussis.

H. Macdonald and E. J. Macdonald (*Journal of Infectious Diseases*, November-December, 1933) made observations on four healthy brothers to determine whether whooping cough is caused by a filter-passing virus or by the bacillus of Bordet and Gengou. Immunity produced by vaccine of *Bacillus pertussis* was also investigated. None of the four children had ever had whooping cough, and two, aged nine and eight, had been vaccinated five months before with pertussis vaccine. The method employed in the investigation was as follows. A cough-plate of Bordet medium was exposed to a child with typical whooping cough. Three days later a typical colony of *Bacillus pertussis* from this plate was spread on a Petri plate of the medium, and after three days' incubation several hundred typical colonies had appeared. One-half of the growth was scraped off and suspended in seven cubic centimetres of sterile physiological solution of sodium chloride. The contents were shaken and passed through a sterile Chamberland L3 candle. Ten minims of the culture filtrate were instilled into the nose and throat of each child. After they had all remained free from symptoms for eighteen days, a well isolated colony from the intact half of the refrigerated plate was suspended in five cubic centimetres of sterile physiological solution of

sodium chloride, and a volume containing one hundred and forty organisms was instilled into the nose and throat of the four children. The two vaccinated children remained free from infection during the entire period of observation, and their blood counts remained normal. The two boys who had received no vaccine began to cough seven days after the second inoculation of nose and throat and their cough-plates became positive. A week later their coughing had become severe and each had developed a leucocytosis. Each passed through a severe attack of whooping cough. The results indicate that the disease is caused by *Bacillus pertussis* and not by a filter-passing virus, and that immunity is conferred by injection of *Bacillus pertussis*.

HYGIENE.

Diversity of Types in Stock Cultures of Streptococcus Epidemicus.

P. R. EDWARDS (*American Journal of Hygiene*, September, 1933) states that epidemics of septic sore throat caused by hæmolytic streptococci have on many occasions been traced to milk. It is generally accepted that these are due to streptococci of human origin, usually from the throats of the milkers or other dairy hands. Human streptococci have been distinguished from bovine by the associated low acidity, reduction of methylene blue, hæmolytic effects, capsule formation *et cetera*. Hæmolytic streptococci from cows, rabbits, guinea-pigs, horses *et cetera* have since been found with identical reactions. These animal streptococci are now found to ferment sorbitol and fail to ferment trehalose, the reverse of the reactions of human organisms. Twenty-four cultures of *Streptococcus epidemicus* from different sources have been tested, and this method of destruction of human and bovine organisms has been verified. Sorbitol fermenters isolated from the udders of cows should not be regarded as of human origin or as causing septic sore throat.

The Cancer Campaign in Italy.

GIORGIO ALBERTO CHIURCO, of Siena, Member of the Italian Parliament and Staff Surgeon Major of the Fascist Militia (*Deutsche Medizinische Wochenschrift*, September 29, 1933) describes the organised action which has been taken in Italy since 1925 to combat cancer. The Government has participated actively, providing funds to establish and maintain diagnostic and treatment centres, to purchase radium, to stimulate research, and to educate the public and the medical and technical personnel of the anti-cancer centres. The Italian Anti-Cancer League, "*Lega Italiana per la Lotta contro il Cancro*", with headquarters in Rome, has as its objects: promotion of the study of malignant growths and of their treatment; propaganda for prophylaxis and early diagnosis; contribution towards the establishment and maintenance of cancer institutes; facilitating the admission to hospital of cancer patients. The League has held a technical congress in Milan. It holds yearly courses of training for personnel, it aims at establishing throughout the kingdom centres at which patients may be examined and receive treatment free of charge. It is in close touch with the universities and public hospitals in regard to these objects. The Italian Red Cross cooperates with the League in propaganda as to the necessity for early treatment, and in the care of patients who have had operation or who are inoperable. The League has given large prizes for cancer research. Its bulletin promulgates all important scientific work on the subject, both Italian and foreign. It has published a handbook of 520 pages, liberally illustrated, in which all the eminent Italian workers have collaborated. There are twenty-three diagnostic centres, fourteen in universities and nine in large towns. Twenty centres for diagnosis and treatment are functioning in large cities. The Victor Emmanuel III Institute in Milan, said to be the largest cancer institute in the world, was founded in 1925. It contains about 300 beds for patients of all classes, large out-patient departments, and extensive pathological and biochemical laboratories. The Regina Elena Institute at Rome is specially concerned with radium. All radioactive material used in the kingdom is tested and standardized here.

Germany's Sterilization Programme.

W. W. PETER (*American Journal of Public Health*, March, 1934) discusses the new law which came into effect on January 1, 1934, in Germany, which compulsorily makes "unfruitful" (*unfruchtbar*) by surgical means "those hereditarily sick where it may be expected with great probability their offspring may suffer severe physical or mental damage, such as inborn feeble-mindedness, schizophrenia, circular insanity, hereditary epilepsy, Huntington's chorea, hereditary blindness, deafness or physical deformity, also those who suffer from severe alcoholism". The ordinary existing courts are not used. Special hereditary health courts (1,700 in number) are set up. The personnel is a district judge presiding, medical officer, and a physician "competent" in hereditary health. The proceedings are not public and penalties enforce secrecy. Physicians are obliged to divulge information without observing professional secrecy. Application for this treatment is made by the individual or legal representatives, medical officers of health and medical superintendents. A month is allowed for objection to be filed. The operation must be conducted in a hospital by a national medical licentiate and may be enforced by the police. Sterilizations not in accordance with the law are permitted only to avert ill health or death (therapeutic) and with the patient's consent. The costs are met by State funds. The cost is estimated at twenty marks and a period in bed of four days for the male, and fifty marks and eight days in bed for the female. It is estimated that 400,000 persons will come under this law, about half of whom are feeble-minded. The first cost is therefore estimated at 14,000,000 marks. Lenz asserts the present cost annually of the hereditarily sick at 350,000,000 marks, and this it is thought will decrease. Feeble-minded patients about to be discharged from mental hospitals are to be first selected. The social burden is at present a great one: 430,000 feeble-minded, 141,910 beds in mental hospitals, 24,519 in feeble-minded institutions, 1,425 chronic inebriates and drug fiends. Large numbers of practitioners have registered.

Epidemiology of Lobar Pneumonia.

W. G. SMILLIE AND F. S. LEEDER (*American Journal of Public Health*, February, 1934) have made a study of contacts, both at home and at hospital, of cases of lobar pneumonia due to Types I and II pneumococcus. Included in the investigation were family contacts of seven days' duration and hospital contacts in contagious beds or small wards. A high proportion, 24%, of family contacts were homologous carriers, but among hospital staff or patient contacts the percentage was low—1·6. Family homologous carriers proved as likely to occur after one as after seven days' contact. Of the homologous carriers 76% had colds when cultures were made. In a residential colony, two wards of 213 (48·3%) harboured pneumococci. The introduction into the ward of a healthy carrier of Type I failed to infect the new contacts during ten days' presence in the ward. Infection occurred of a resident medical officer who was operating on a patient with empyema due to organisms of Type I. Overcrowding in the home and low economic status did not influence the production of carriers.

Specific Immune Serum as an Inhibitor of Infection.

HARRY M. MILLER, JUNIOR (*American Journal of Hygiene*, January, 1934), in an article dealing with specific immune serum as an inhibitor of infection by a metazoan parasite, *Cysticercus fasciolaris*, reports that immune serum collected from infected rats was found to prevent more or less completely the development of *Cysticercus fasciolaris* in rats receiving a single injection of immune serum within nine days after being infected. The author suggests that in a relatively slow developing form like *Echinococcus granulosus* immune serum may be effectively used at longer intervals.

Special Articles on Treatment.

(Contributed by request.)

XXXII.

THE TREATMENT OF ACUTE LARYNGITIS.

THE treatment of acute laryngitis is usually confined to simple measures, but if it occurs in a larynx the subject of other lesions, more drastic efforts may be necessary.

The treatment may be divided into general and local.

General Treatment.

Rest in bed is essential, as there is always a grave danger of a spread to the trachea, bronchi or lung tissues.

An even temperature of the atmosphere should be maintained, while aperients and plenty of bland fluids with citrates should be administered. The citrates should not be continued for more than two days, as dyspepsia may result.

The diet should be light, as in all acute upper respiratory inflammation.

An aspirin, phenacetin and caffein mixture, taken every four hours, is extremely useful in allaying the pain and discomfort.

Fairly frequent sponging, hot water bottles and, generally, careful nursing are important factors in a quick recovery.

Anti-diphtheritic serum taken by mouth is strongly recommended by many physicians.

Local Treatment.

Vocal rest is the most important local measure needed, and absolute silence should be insisted upon. Rest of an inflamed area plays such a large part in treatment in all parts of the body that one finds it hard to understand why the importance of silence in any laryngeal inflammation is not more fully recognized.

After vocal rest it is important to stimulate secretion of the region.

A stimulating expectorant should be given, and in children showing signs of croup a teaspoonful of *vini ipecacuanhæ* helps to expel the mucus. An inhalation of menthol 0·6 gramme (ten grains), oil of eucalyptus 0·6 mil (ten minims), oil of pine 0·6 mil, made up to 30 cubic centimetres (one fluid ounce) with compound tincture of benzoin, is useful. Four cubic centimetres (one fluid drachm) should be inhaled from 600 cubic centimetres (one pint) of boiling water three times a day.

Opiates or belladonna are thus not indicated. The pain may be so distressing, however, that it may be necessary to give codeine lozenges for its relief.

The question of local applications to the front of the throat is somewhat mixed. Most authorities recommend cold applications, such as ice packs; others warm ones, such as "Antiphlogistine". The writer's experience inclines him toward the latter. St. Clair Thomson suggests the use of a mustard leaf as a counter-irritant.

Associated conditions should be looked for and treated. In this connexion it must be pointed out that sinusitis is not only very commonly associated, but is frequently the primary condition.

It is necessary, then, to examine carefully the nose and naso-pharynx. If there be any signs or symptoms of purulent sinusitis, antral puncture and lavage should be carried out as frequently as once every two days if the return contains much pus.

Nasal drops or a spray of 2% "Neosilvol" in a 1% ephedrine solution should help resolution of the nasal condition.

In patients already the subject of chronic laryngeal disease, such as tuberculosis, syphilis, or malignant disease, there is a likelihood of death from asphyxia, and it should be remembered that these patients, suffering from a restricted laryngeal airway, frequently die very quickly from acute laryngitis without showing as much evidence of respiratory embarrassment as one might expect.

In these cases, though most of the treatment is the same as in previously normal cases, counter-irritants and hot applications should not be used at all, nor should warm applications be used so freely. Cold is more likely to help.

If signs of respiratory embarrassment appear, tracheotomy should be performed.

GEORGE C. SCANTLEBURY,
M.B., B.S. (Melb.), F.R.C.S. (Edin.),
Medical Officer in Charge of Ear, Nose and Throat Department, Melbourne Hospital, Melbourne.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Saint Vincent's Hospital, Darlinghurst, on September 21, 1933. The meeting took the form of a series of demonstrations by members of the honorary staff. The first part of this report appeared in the issue of May 12, 1934.

Parasagittal Meningioma.

DR. DOUGLAS MILLER showed a male patient, aged twenty-nine years, who had noticed failing eyesight for about one year. This had progressed to almost total blindness. For about eight months he had some frontal headaches in the morning, of variable intensity and duration. He had had no headaches recently. He had suffered from a few attacks of vomiting some months previously. During the two months preceding admission to hospital he had occasional attacks of tingling in the left leg and tended during these attacks to drag the leg.

On examination he had double fixed dilated pupils. This sign gave some difficulty in interpretation. The fundi showed double papilloedema of four diopters. There was slight impairment of power in the left upper and lower limbs, and definite interference with proprioceptive sense in the left leg. Otherwise neurological investigation revealed no abnormality. X ray examination revealed an area of erosion in the right parietal region. Osteoplastic exploration revealed a large parasagittal meningioma lying under the area of erosion. Owing to very great vascularity of the scalp and skull no more could be done at the first session, and the patient was awaiting a further attack on the tumour.

Acoustic Nerve Tumour.

Dr. Miller showed a specimen of an acoustic nerve tumour. He said that the case was shown as an interesting error in diagnosis. The patient was a male, aged fifty-five years. Nine months prior to admission to hospital he had sustained a head injury, followed by transient unconsciousness and complete recovery. Three months later he commenced to suffer from severe frontal headaches, attacks of vomiting, occasional diplopia, loss of memory, and general impairment of executive capacity. His gait became staggering, with a tendency to fall towards the left. He had had several attacks of complete unconsciousness. He had been deaf in both ears for many years. On examination he was drowsy, with intelligence very much below par and a slurring type of speech. There was bilateral ptosis, about four diopters of papilloedema, and nystagmus on looking to the left. There was slight loss of sensitivity of the left cornea and occasional slight left facial spasm. The left ear was almost completely deaf, and very impaired hearing was found in the right. His gait was so unsteady that it was difficult to observe, but he appeared to fall to the left. Further investigations revealed no abnormality.

A tentative diagnosis of chronic subdural hæmatoma was made, in view of his head injury and the insidious

and vague nature of his signs and symptoms. At operation an exploratory trephine hole was made over each parietal region and no hæmatoma was found. The lateral ventricle was then tapped and increased fluid under pressure was replaced by air. Ventriculograms revealed bilateral internal hydrocephalus. A tentative diagnosis of tumour in the region of the *corpora quadrigemina* was then made and the condition was regarded as inoperable. The patient died some time later and an autopsy was done. A large left-sided acoustic nerve tumour was found. The fifth and seventh nerves were so intimately associated with the tumour that they could not be separated.

Dr. Miller pointed out that in the consideration of the picture two little attention was paid to the deafness of many years' standing. The bilateral nature of the deafness was a not uncommon feature of unilateral tumours. Not sufficient weight was given to the history of slight left-sided facial spasm. The ventriculogram showed internal hydrocephalus due to a posterior fossa tumour, and it should have been noted that almost all posterior fossa tumours after the age of fifty were acoustic nerve tumours. If the case had been reviewed and proper emphasis had been given to these facts, a correct diagnosis might have been made.

Buerger's Disease.

Dr. Miller also showed a male, aged twenty-nine years, a native of Macedonia. Ten months previously he commenced to suffer from pain in the left foot aggravated by walking and relieved by rest. He was treated for some time for a flat foot. About six months later the pain became very much worse and marked postural colour changes appeared about the toes. He could now hardly walk because of the severity of the pain. He has no Jewish blood. He smoked about three ounces of tobacco per week.

On examination, when dependent, the margins of the left foot and all the toes became very congested and cyanotic. On elevation of the limb it rapidly became blanched. The *dorsalis pedis* artery was not palpable. There was slight ulceration around the nail of the little toe. The rest of his cardio-vascular system appeared normal. Oscillometric investigations showed no oscillations in the left leg below the knee. Oscillations in the other limb were normal.

After a course of acetyl-choline, soaking in a hot bath, and a spinal anæsthetic, no oscillations could be obtained. The diagnosis of Buerger's disease was obvious, and the oscillometric investigations indicated that any interference with the sympathetic system would not result in improvement.

Congenital Abnormalities.

Dr. Miller showed several patients who were suffering from congenital abnormalities.

1. A male patient, aged eighteen years, had congenital absence of the forearm from just below the elbow. At the end of the stump was a minute fœtal hand, on which could be discerned vestigial nails and typical fingerprints. This was a comment on the view that such deformities were due to intrauterine amputations.

2. A male patient, aged eight years, had almost complete failure of development of the ventral abdominal musculature. The viscera could be most readily handled, and both liver and spleen showed a considerable degree of ptosis. The patient had been fitted with an abdominal corset.

3. A female patient, aged thirty-nine years, had cervical ribs with marked ulnar nerve involvement on the left side. The left forearm also showed a congenital synostosis of the inferior radio-ulnar joint.

Salpingostomy.

Dr. Cecil Coghlan showed hystero-salpingographs illustrating certain points in the investigation of sterility in the female, namely, genital hypoplasia, double uterus, and cases suitable for salpingostomy, the films showing this condition before and after operation.

He also showed specimens of polycystic ovaries which had developed shortly after the operation of salpingostomy. These specimens were from a series of fourteen cases collected during the last two years, and the period between the primary operation and the secondary varied between five months and two years. These cases were characterized by pain, sometimes very severe, following on the primary operation and irregular and painful menses. In two cases in which only one tube had been removed, the ovary, on that side only, showed cystic degeneration. The cause of this condition was probably faulty technique in the performance of the primary operation, the operator, in removing the tube, cutting too deeply into the mesosalpynx and interfering with the nervous and vascular supplies to the ovary, thus producing a condition of chronic congestion and interference with normal functions.

Dr. Coghlan suggested that to avoid this condition the operator, in removing a tube, should keep as close to it as possible and avoid clamping the mesosalpynx, picking up the Fallopian vessels as they were exposed. Usually this was necessary only at the distal and proximal ends of the tube. He had noted the development of these cystic ovaries too frequently following the operation of salpingostomy for it not to be a factor in their causation, and the development of a cystic ovary on one side only when the corresponding tube had been removed, strongly added support to this contention.

Retinal Hæmorrhages and Lymphocytosis of the Cerebro-Spinal Fluid.

Dr. R. Jeremy showed a male patient, aged twenty-eight years, a carpenter. His family history was not abnormal. The patient had suffered from meningitis at one year and ten months. He led an athletic life up to the age of twenty-three years. He was married and had one child.

During the past twelve years he had had occasional "bilious attacks"—headaches with vomiting. Nine months previously he had noticed dimness of vision of the left eye which lasted fourteen days and recurred two days later after his return to work. It was then found that this symptom was due to retinal hæmorrhage. During the nine months of his illness he had had six or seven recurrences; he had not been conscious of any impairment of the sight of the right eye. He had had a "dull, heavy head" during most of this time.

About two months previously, on four days of one week he had had attacks of "numbness" over the left half of his body, followed almost immediately by severe right-sided headaches, accompanied by vomiting; the sensation of numbness lasted about ten minutes and the headaches for ten to twelve hours. Since then he had had attacks of generalized numbness with headaches and loss of speech. The sensation of left-sided numbness with headache was not associated with loss of speech. These attacks usually began in the early morning.

Dr. A. L. North reported that for nine months there had been present recurring retinal hæmorrhages, more marked in the left eye, but present also in the right. There was retinal œdema, but no papillœdema, and some chorioidal atrophy and pigmentation at the periphery of the left retina. When Dr. North last saw the patient there was one long streak of hæmorrhage below the left inferior temporal artery and some hæmorrhage near the right inferior nasal vessel.

Examination of the central nervous system revealed no abnormality except that lumbar puncture yielded a fluid which on three occasions showed an increase of globulin and 90 to 100 lymphocytes per cubic millimetre. The Wassermann test gave no reaction. The chlorides were 750 to 850 milligrammes per 100 cubic centimetres. No tubercle bacilli were found.

X ray examination of the skull revealed no bony abnormality. In the antra slight thickening of the lining mucosa was found. No definite sepsis was detected in the teeth.

The full blood count was normal. Coagulation time was not delayed. The bleeding time was slightly increased—four minutes. Fragility of the red cells was within normal limits. The blood did not react to the Wassermann test. The blood pressure and cardio-vascular system were normal. No abnormality was found in the urine.

It was suggested that further examinations of the blood be carried out. The case was not recognized as a clinical entity.

Procidentia Uteri.

DR. M. BRITNELL FRASER presented a case of *procidentia uteri* in a nulliparous woman, aged seventy-two, complicated by cystitis and two vesical calculi. The prolapse had been present for over ten years, with severe bladder symptoms for six weeks.

Under spinal anæsthesia repair of the cystocele was done on June 1, 1933, by Blair Bell's buttress method, and the usual perineorrhaphy was performed. X ray examination on June 10, 1933, showed two large vesical calculi. These were removed suprapubically by Dr. Miller on June 12, 1933.

The patient was discharged on July 14, 1933, with the perineal operation wound healed. In four weeks she was readmitted with a recurrence of the cystocele and some sloughing of the anterior vaginal wall.

Dr. Fraser said that this case demonstrated the part played by the pubo-vesical muscle, described by Bonney, and the pubo-cervical portions of the endo-pelvic fascia in supporting the anterior vaginal wall and bladder. The atrophy of the two structures allowed the cystocele to recur, but the rectrocele did not.

Skiagrams.

DR. B. P. ANDERSON STUART showed numerous skiagrams of interest. Amongst them were skiagrams of a patient with very advanced Charcot's disease of both hip joints and of the right tarsus. Symptoms were developing in the knees, but these were as yet radiologically clear. Another case showed chronic indurative pneumonia simulating tuberculosis. Dr. Stuart also showed cases of scurvy, subphrenic abscess and unusual intravenous pyelograms.

DR. ALAN F. OXENHAM showed a series of interesting skiagrams demonstrating unusual pathological conditions around the knee joint. Also several other bony abnormalities, including a marked fracture dislocation of the seventh cervical vertebra. This fracture was of considerable interest, as it was causing no pressure symptoms, and one had to go back ten years before any history of trauma could be obtained from the patient.

Dr. Oxenham also showed intravenous and retrograde pyelograms of a patient who had a carcinoma of the left renal pelvis.

Medical Practice.

DANGEROUS DRUGS REGULATIONS OF VICTORIA, 1930.

THE following statement is published at the request of the Victorian Branch of the British Medical Association.

As many medical practitioners do not seem to be aware of the existence of the Dangerous Drugs Regulations, the Council of the Victorian Branch issues these regulations for the information of its members.

Dangerous Drugs.

Among others, the following drugs must not be sold or dispensed except on the valid prescription of a doctor, dentist or veterinary surgeon: morphine, cocaine, diacetylmorphine (heroin).

Form of Prescriptions.

(*a*) The prescription shall be in writing, shall be dated and signed with the usual signature of the doctor, and shall specify his own address and the name and address of the person for whom the prescription is given.

(*b*) Every medical practitioner who writes a prescription containing a dangerous drug shall write on such prescription the maximum number of times such prescription shall be dispensed.

(*c*) Where the prescription contains an unusual, or what may be regarded as a dangerous dose, the prescriber shall indicate that such dose is intended by underlining that part of the prescription and by inserting his initials in the margin.

(*d*) The use of a rubber stamp or other such contrivance in lieu of the written signature on a prescription for dangerous drugs is prohibited.

(*e*) The prescription shall not be written in secret code or cipher.

(*f*) In an emergency case, where a prescription is issued orally to any pharmaceutical chemist, such prescription shall be forthwith reduced to writing and given or dispatched without delay to such chemist by the doctor issuing it.

There is a special exemption where the medical practitioner certifies that the drug is required for a person suffering from a chronic or malignant disease. This certificate is valid for six months and is then automatically cancelled.

Specified Drugs.

Among others, the following come under the classification of "specified drugs": Chloral hydrate, ergot, paraldehyde, barbituric acid and all metallic derivatives of barbituric acid, such as "Luminal", veronal, sulphonal *et cetera*.

Every medical practitioner who prescribes any "specified drug" shall write on such prescription the maximum number of times such prescription shall be dispensed.

Such prescription shall not be dispensed more than twice unless the prescription so directs, and then the chemist must write across the prescription the word "cancelled".

Preparations containing not less than 10% of chloral hydrate or not more than 1% of barbituric acid or derivatives are exempted from the regulations.

These "specified drugs" regulations do not apply if the medical practitioner supplies a certificate stating that the drug is required for a person suffering from epilepsy or any chronic or malignant disease. This certificate is valid for three months and is then automatically cancelled.

The following letter from the Registrar of the Pharmacy Board of Victoria shows the difficulty experienced by pharmaceutical chemists through the failure of medical practitioners to comply with the regulations:

> The Board is experiencing considerable difficulty in administering the provisions of the Dangerous Drugs Regulations, and I have been asked to write soliciting the co-operation of the members of the medical profession in the carrying out of the regulations.
>
> In the first place it would greatly assist the Board if medical men only ordered such drugs as morphia, cocain, heroin, veramon, veronal, luminal, phenobarbital, amytal, dial, chloral hydrate, paraldehyde, ergot and ergotin, on their printed prescription forms.
>
> Experience shows that prescriptions are often written on odd scraps of paper. This practice makes it more difficult for pharmacists to tell whether a prescription is genuine or not. It is very disquieting to find that the number of forged prescriptions calling for narcotic drugs is increasing. Most of these forgeries are written on ordinary notepaper, but the fact that many genuine prescriptions are also written on similar scraps of paper makes it harder to detect a forgery than would be the case if all genuine prescriptions were written on printed forms. Another difficulty that confronts the Board is the practice of medical men ordering narcotic and hypnotic drugs verbally. As the law prohibits a pharmacist from supplying these drugs except on prescription, patients express annoyance when their verbal orders are not executed. The pharmacist is then tempted to take the easier course and let the patient have what is asked for.
>
> So long as patients are under the impression that they can obtain hypnotic drugs simply by asking for them, and medical men encourage the practice by issuing verbal orders only, it is contrary to human nature to expect patients not to purchase more and more of the medicine and so acquire the habit of promiscuous use of these drugs.

In the case of such drugs as luminal, amytal, veronal, ergot, etc., the law provides that a prescription can be endorsed to be repeated a certain number of times. The regulation definitely requires the prescriber to write thereon the maximum number of times it is to be repeated. This provides an opportunity for medical men to prescribe a reasonable quantity without a further visit from the patient. It is suggested that if it were a general rule to endorse the prescription with the words "Not to be repeated more than . . .", it would educate the public to know that these drugs required to be taken with discretion and always on medical advice. The Board feels that it is impossible to insist on a strict compliance with the regulations by pharmacists without the full co-operation of the medical profession and that unless this co-operation is freely forthcoming there is a strong feeling that it will be necessary to review the whole position, possibly in the direction of removing the existing restrictions, at any rate so far as the hypnotic and ecbolic class of drugs is concerned.

Correspondence.

OCULISTS AND OPTOMETRISTS.

SIR: The letter of Mr. Knapp (*vide* THE MEDICAL JOURNAL OF AUSTRALIA, April 28, 1934) should not go unchallenged. The dictum he seeks to elaborate is that no ophthalmologist can refract and that all optometrists can. The refractions quoted may mean a lot or a little. Anyway, one swallow does not make a summer any more than does an odd black sheep determine the colour of the whole ophthalmic flock. I scarcely think our journal is the correct medium in which to publish such letters and heresies as those of Mr. Knapp. Fair criticism if you like, but not the rubbish this gentleman ventures upon. Note the almightiness of Mr. Knapp—"These should have been". Words of wisdom of the final arbiter of all refractions!

It were well for all parties to know that many of us do not share the views aired at the Congress, and have little or no quarrel to pick with the optometrist and optician as long as he remains what he is, but the tendency certainly seems to be an evolution into the complete medical specialist. If our sphere be attacked and encroached upon, the optician must not demur or squeal if he finds he has given cohesion to a loose body of medical men who finally unite in a determination of self-preservation. That is what the optician has to expect if he becomes so over-specialized as to threaten a medical preserve. Surely it were wiser for each party to accept a *modus vivendi*. The optometrist is here to stay, just as much as the ophthalmologist is here to stay. There will be the good and poor practitioner in each group, and no amount of slander or distortion will rob either of its esteem or utility.

If the optometrist chooses to take battle with us, let us by every power we possess and by an unexpected effort of unity counter-attack and counter-attack again; but at at the moment there does not appear to be necessity to disturb the existing amicable enough associations of the two camps.

Yours, etc.,

"PAX VOBISCUM."

Sydney,
May 7, 1934.

ARTIFICIAL RESPIRATION.

SIR: In our capacities of Honorary Medical Advisers to the Surf Life Saving Association of Australia it has come to our notice that on several occasions medical practitioners attending cases during resuscitation have ordered the abandonment of the Schafer method of artificial respiration and the substitution of the Sylvester method. While recognizing the value of the latter method in cases of respiratory failure during operations where the patient is in the supine position, we can see no reason for its use in the case of the apparently drowned. Here, in addition to being adequate, the Schafer method possesses the very real advantage of facilitating drainage of fluid from the respiratory tract.

The present methods for resuscitation which are taught and used by the Surf Life Saving Association of Australia or the Royal Life Saving Society were drawn up after much thought, discussion and experimental investigation by a committee of distinguished clinicians and scientists. Any arbitrary modification of these methods is not only confusing for the operators, but also likely to lower the prestige of any practitioners who attempt it. In such cases the duty of the medical practitioner is mainly to supplement the methods in use, for example, by ordering and administering suitable stimulants and advising on treatment for shock. He must also judge whether the patient is fit to be removed to shelter, home or hospital, or, in a severe case, whether life is extinct.

In connexion with the latter it might be well to point out that in cases of electrocution recoveries have occurred after prolonged artificial respiration (over eight hours). In such cases the nearest surf life saving club would willingly furnish a team of trained operators, while in Sydney the Drinker apparatus at the Royal Alexandra Hospital for Children is in working order and available for the treatment of adults as well as children.

Yours, etc.,

H. WHITRIDGE DAVIES.
HARVEY SUTTON.

Departments of Physiology and of Public Health,
University of Sydney,
May 7, 1934.

Analytical Department.

"BRAMEAL."

"BRAMEAL", manufactured in Melbourne for the Union Manufacturing and Agency Company, is described as pure proteins from pure grain. The manufacturers claim that when "Brameal" is used it is possible to reduce in quantity or to dispense with expensive protein foods. Directions for making "Brameal" bread and diabetic bread are given on the container. The percentage composition is claimed by the manufacturers to be as follows:

Moisture	10·75%
Protein	80·60%
Fat	1·40%
Fibre	1·25%
Ash	1·50%
Carbohydrate	4·50%

A sample of the food was submitted to our analysts, who report the following results of their analysis:

Moisture	9·0%
Protein	74·6%
Fat	2·2%
Crude fibre	1·0%
Ash	1·4%
Nitrogen-free extract	11·8%

Our analysts point out that their results agree quite well with the figures claimed by the manufacturers, except in regard to protein. They state that they found 6% less protein than is claimed, and that consequently, since the figure for nitrogen-free extract is a difference figure, their result for this constituent of the food is correspondingly increased. The nitrogen-free extract probably contains only 32% to 40% of starches, sugars and dextrins, and therefore the content of these materials in the original food would amount to only 4% to 5%. In other words, the result found on analysis is in moderately close agreement with the figures claimed by the manufacturers.

The reduction of carbohydrate content in relation to protein has been well achieved in "Brameal". It may be regarded as suitable for use when a food with a high protein and a low carbohydrate content is required.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A MEETING of the Senate of the University of Sydney was held on May 7, 1934.

A letter was received from Professor Grafton Elliot Smith (University College, London) agreeing to act as representative of the University of Sydney at the International Congress of Ethnology and Anthropology to be held in London in August next.

The Perpetual Trustee Company, Limited, advised that a legacy of £600 had been bequeathed to the University from the estate of the late S. T. D. Symons for the foundation of an annual prize in the Faculty of Veterinary Science.

It was decided to nominate Professor J. T. Wilson (Cambridge) and Professor J. I. Orme Masson (Durham) to represent the universities of Australia on the Executive Council of the Universities Bureau of the British Empire.

The following appointments were approved: Dr. S. H. Lovell and Miss W. R. Mankin, M.Sc., as part-time Demonstrators in Physiology; Mr. A. R. Robinson as Student Demonstrator in Physiology.

Obituary.

FRANK NYULASY.

WE regret to announce the death of Dr. Frank Nyulasy, which occurred on May 7, 1934, at Melbourne, Victoria.

Books Received.

RECENT ADVANCES IN VACCINE AND SERUM THERAPY, by A. Fleming, F.R.C.S., and G. F. Petrie, M.D.; 1934. London: J. and A. Churchill; Australia: Angus and Robertson. Demy 8vo., pp. 473. Price: 22s. 6d. net.

Diary for the Month.

MAY 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAY 23.—Victorian Branch, B.M.A.: Council.
MAY 24.—New South Wales Branch, B.M.A.: Clinical Meeting.
MAY 25.—Queensland Branch, B.M.A.: Council.
MAY 31.—South Australian Branch, B.M.A.: Branch.
MAY 31.—New South Wales Branch, B.M.A.: Branch.
JUNE 1.—Queensland Branch, B.M.A.: Branch: Bancroft Memorial Lecture.
JUNE 5.—Tasmanian Branch, B.M.A.: Council.
JUNE 6.—Western Australian Branch, B.M.A.: Council.
JUNE 6.—Victorian Branch, B.M.A.: Branch.
JUNE 7.—South Australian Branch, B.M.A.: Council.
JUNE 8.—Queensland Branch, B.M.A.: Council.
JUNE 12.—Tasmanian Branch, B.M.A.: Branch.
JUNE 12.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 19.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 19.—Tasmanian Branch, B.M.A.: Council.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," pages xvi, xvii and xix.

DEPARTMENT OF DEFENCE, MELBOURNE, VICTORIA: Director-General of Medical Services.

INFECTIOUS DISEASES HOSPITAL, FAIRFIELD, VICTORIA: Senior Assistant Resident Medical Officer.

PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Resident Medical Officers.

ROYAL NORTH SHORE HOSPITAL OF SYDNEY, NEW SOUTH WALES: Temporary Honorary Assistant Surgeon.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing. Lower Burdekin District Hospital, Ayr.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Combined Friendly Societies, Clarendon and Kangarilla districts. Officer of Health, District Council of Elliston. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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